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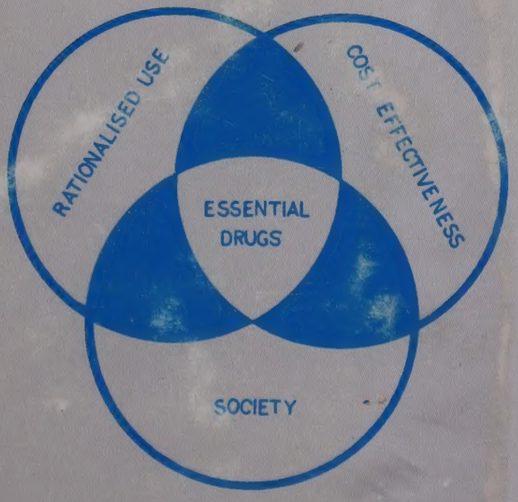
MANUAL FOR TRAINING ON CONCEPT OF ESSENTIAL DRUGS AND RATIONALISED DRUG USE

NATIONAL TEACHERS TRAINING CENTRE,
JIPMER,
PONDICHERRY



IN SUPPORT OF THE ACTION PROGRAMME ON ESSENTIAL DRUGS
AND
RATIONALISED DRUG USE OF WORLD HEALTH ORGANISATION

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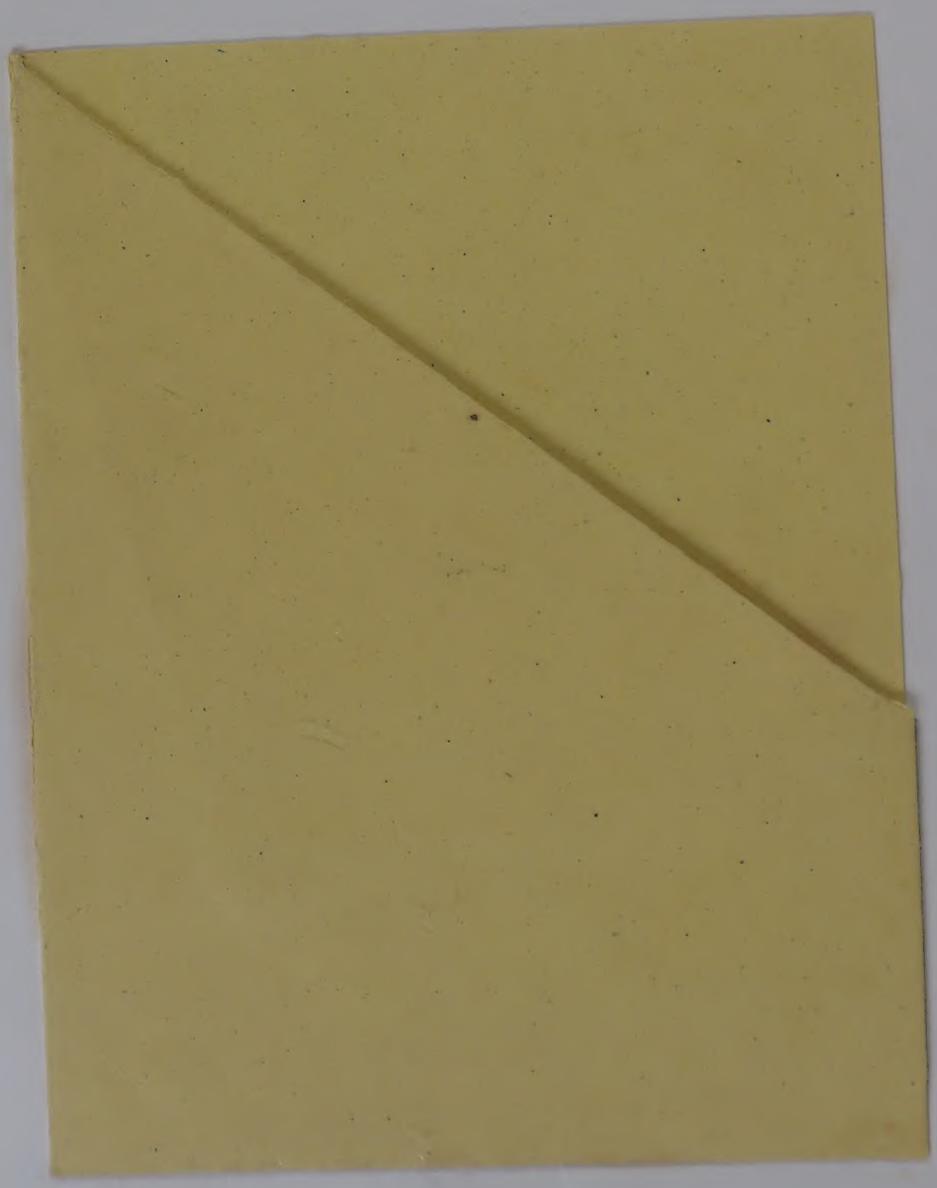

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MANUAL FOR TRAINING ON CONCEPT OF ESSENTIAL DRUGS AND RATIONALISED DRUG USE

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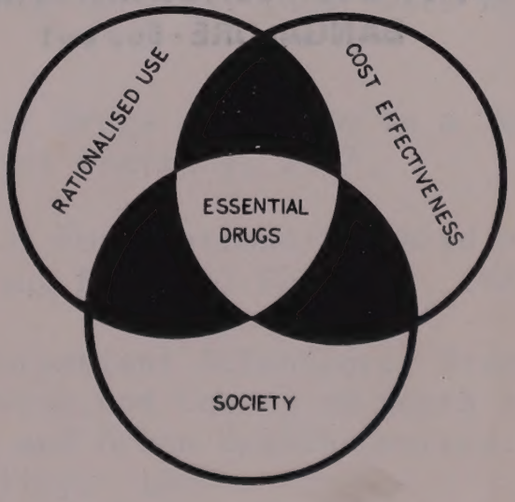

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AND
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INTRODUCTION

The importance of essential drugs concept is well established. In the recent years there has been considerable interest in developing a conceptual framework leading to formulation and implementation of policies and programmes for promoting rational use of drugs on the basis of this concept. However, it has not yet been put into practice at various levels of health care delivery. The most important factor for this is the lack of knowledge of health professionals about the essential drugs concept and inadequate training in clinical pharmacology for rational drug use.

Several international initiatives have taken place in this regard. However, these attempts have concentrated on formulating formal curricula which are difficult and slow to change. There is no information available on co-curricular activities that can be used to introduce various elements of rational drug use to medical and pharmacy students. A programme on essential drugs and cost-effective prescribing was planned and organised for interns at this institute in 1986. It was conducted in the form of weekly introductory lectures. The feed back received through a questionnaire suggested that it could be better if it was conducted as a workshop at the beginning of the internship. In the following year a workshop was organised during the first two days of their internship. It was guided by a multi disciplinary team consisting of faculty members from internal medicine, general surgery, obstetrics & gynaecology, community medicine, paediatrics and clinical pharmacology departments. The main focus of this programme was on problem solving approach using case histories, and group discussions. The response received through programme evaluation was overwhelmingly positive.

Our experience indicates that this kind of sensitization is likely to go a long way in rationalised use of drugs by the fresh medical graduates. This manual has been prepared to share the experience gained at this institute with the other medical institutions for propogating the idea of rationalised drug use for benefit of the society.

OBJECTIVES

At the end of the period of training the participants shall be able to:

- Appreciate the role of national health policy and national drug policy in primary health care.

- Understand the concept of essential drugs in the context of primary health care.

- Plan and introduce these concepts in their undergraduate and postgraduate curriculum.

- List criteria used for establishing essential drug list for:

    a) Teaching hospital/referral centre

    b) Primary health centre

    c) Sub centre and village health worker

- Appreciate the role of drug utilisation studies in monitoring pattern of drug use/misuse.

- Apply this knowledge of drug utilisation to improve the prescribing habits.

- Critically analyse the list of drugs provided and recommend weeding out of non essential ones.

- Appreciate the relationship between cost of drugs and patient compliance.

- Appreciate the suggestions from professional colleagues to improve the quality of medical care and to reduce the cost of medical expenses.

- List ill effects of polypharmacy.

- List situations where combined use of antimicrobials are justified.

- Critically analyse propaganda materials/leaflets published by drug manufacturers.

- Prescribe rationally and tailored to needs of individual patients.

LIST OF RESOURCE PERSONS AND FACULTY WHO HAVE ASSISTED IN THE DEVELOPMENT OF THE MANUAL AND IN THE TRAINING

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CONCEPT OF ESSENTIAL DRUGS

Q. What is the meaning of essential drugs?

A. Essential drugs are those that satisfy the health care needs of majority of the population and therefore should be available at all times in adequate amounts and in appropriate dosage forms.

Q. Is essential drugs list the same as limited drug list?

A. Both these terms are synonymous.

Q. Are all drugs not figuring in essential drugs list useless or redundant?

A. A list of essential drugs does not imply that no drugs outside it are useful. These drugs may be more expensive alternatives or useful only for uncommon ailments. Some may however be harmful and hazardous. The essential drugs list does not imply that other drugs should not be used.

Q What are the benefits of having an essential drugs list?

A. The advantages are:

a) More cost effective drug control, management, purchase, storage, turnover and distribution. More patients could be treated per unit cost.

b) Improved drug use in terms of safety, simplified and more efficient drug information including training to health workers.

c) To be able to define real health needs and to perform programme evaluation more effectively.

d) Easy identification and avoidance of adverse drug reactions and interactions with fewer drugs.

e) Stimulation of local drug formulation and production depending on the requirement.

Q. What is the situation of world production and distribution of drugs?

A. Distribution of drugs is disproportionate in developed and developing countries. The majority of world's drugs (85%) are produced and consumed by developed countries. The developing countries which constitute 66% of the world's population get only 15% of the drugs.

Q. How was the concept of essential drugs evolved?

A. Based on the fact that health needs could not be met by existing supply system, WHA 28:66 resolved that Director General of WHO be requested to advise member states on the selection and procurement of essential drugs at reasonable cost, of established quality corresponding to their national health needs. Following wide consultation, an initial model list of essential drugs was included in the first report of expert committee on selection of essential drugs in 1977. So far it has been revised 4 times. The latest model list available is of 1985, WHO Technical Series 722.

Q. Is model list of essential drugs of WHO a universal list?

A. The WHO list is intended only to serve as a "model" or "guiding list". The preparation of a drug list of uniform, general applicability and acceptability is not feasible or possible because of the great difference exist in the philosophy and nature of economic systems among the countries. Therefore each country has the direct responsibility of evaluating and adopting a list of essential drugs according to its own policy.

Q. Should the essential drugs lists be changed from time to time? If so, what can be the reasons for changing essential drugs list?

A. The essential drugs list may need to be reviewed yearly or whenever necessary to incorporate significant new therapeutic advances and information taking into account the changing public health needs and epidemiological conditions.

Q. What are the components of the primary health care concept? Do they have any relationship with essential drugs?

A. The components are:

a) Education for health.

b) Promotion of food supply and proper nutrition.

c) Safe water supply and sanitation.

d) Maternal and child health, and family planning.

e) Immunisation against infectious diseases.

f) Control of epidemic diseases.

g) Treatment of common diseases.

h) Provision of essential drugs.

Q. What are the guidelines for preparing an essential drugs list?

A. The selection of drugs should be based upon established health needs, not simply upon professional or public demands.

The established criteria are:

a) Morbidity and mortality statistics.

b) Training of health worker and treatment facilities.

c) Efficacy and safety.

d) Financial resources.

e) Genetic, demographic and environmental factors.

f) Availability in the form in which quality could be assured.

g) Total cost of treatment.

h) Formulations as single compounds.

i) Ease of administration and compliance.

j) Local manufacture and storage.

DRUG COMBINATIONS

OBJECTIVES:

At the end of the session the participants shall be able to:

1. List criteria for acceptability of fixed ratio combinations.
2. Enumerate three advantages and three disadvantages of fixed ratio combinations.
3. Critically evaluate drug combinations and recommend weeding out of irrational combinations.

LEARNING EXPERIENCE:

1. Introduction outlining the various aspects of drug combinations.

1.1 Group task involving comments on and criticism of drug combinations available in the local market.

1.2 Plenary session.

EVALUATION:

Through observation of proceedings during group work and plenary session.

RESOURCES:

a) Hand outs.

b) Overhead projector.

c) Extrans and marker pens.

d) Slide projector and slides.

DRUG COMBINATIONS

Fixed dose-ratio combination products are acceptable only when the dosage of each ingredient meets the requirements of a defined population group and provides a proven advantage over single compounds, administered separetely, in therapeutic effect, safety or compliance.

Two factors which play an important role in making the cost of treatment high are the expensive fixed dose drug combination and the irrational use of drugs mostly as combinations because of lack of education.

Drug Combinations:

Fixed dose-ratio combinations are acceptable only if the following criteria are met:

1. Clinical documentation justifies the concomitant use of more than one drug.
2. The therapeutic effect is greater than the sum of the effect of each of the drugs.
3. The cost of the combination product is less than the sum of the individual drugs.
4. Compliance is improved.
5. Sufficient drug ratios are provided to allow dosage adjustments.

Advantages of Combinations:

- Improved compliance
- Greater convenience
- Synergic effect (trimethoprim + Sulphamethoxazole)
- Avoid resistance (to treat tuberculosis)
- Curb drug abuse (diphenoxylate + atropine)

Disadvantages of combinations:

- Inappropriate dosage
- Increased risk of adverse reactions
- Ingredients of doubtful effectiveness
- Irrational mixtures (cough mixtures)

- Higher cost

The model list of essential drugs of WHO, has included 9 useful drug combinations which are given in the table 1.

Table 1

Trimethoprim + Sulphamethoxazole (antibacterial)
Levo-dopa + Carbidopa (Parkinson's disease)
Norethisterone + Ethinylestradiol (oral contraceptive)
Levonorgestrel + Ethinylestrdiol (oral contraceptive)
Sulphadoxine + Pyrimethamine (antimalarial)
Neomycin + Bacitracin (for external use)
Benzoic acid + Salicylic acid (for external use)
Lidocaine + Epinephrine (local anaesthesia)
Thiacetazone + Isoniazid (antituberculous drug)

The above mentioned combinations provide a better therapeutic effect. The combination of thiacetazone and isoniazid also offers improved compliance and avoidance of resistance.

In U.S.A. there are 30,000 brand preparations for less than 1,000 drugs. Most of these are combinations of two or more drugs. The situation in India is still worse. There are about 40,000 to 60,000 brand preparations for almost the same number of drugs. A vast majority of them are not only sold at a higher price than the combined value of the ingredients but have the drugs that are useless, superfluous and sometimes positively harmful. The whole system is full of inequalities, contradictions and irrationality.

Normally, when two or more drugs having similar action are combined, the dose of each of the drug is reduced, but surprisingly, the total price goes up by several times. There is hardly any pharmaceutical company which is not marketing drug combinations. Even the rich multinational houses, who

unlike in their parent country, have introduced such combinations for which there is a flourishing market in India. Once a drug combination is approved by the local drug control authority, it is sold all over the country.

A list of different fixed dose-ratio drug combination mentioned in a recent issue of MIMS is given in the table 2. It is practically impossible to remember the names of dozens of preparations what to say of their ingredients.

Table 2

NUMBER AND TYPES OF FIXED-DOSE COMBINATIONS MENTIONED IN THE MONTHLY INDEX OF MEDICAL SPECIALITIES 1988.

Antidiarrhoeal (70)
Antacids (50)
Oral Contraceptives (11)
Urinary Antiseptics (24)
Sulphonamides (42)
Iron Preparations (66)
Cough Suppressants (71)
Nasal Decongestants (14)
Antiallergics (16)
NSAID (24)
Antihypertensives (13)
Analgesics (49)
Gonadal (31)
Antibiotics (54)
Vitamins (110)
Tonics (45)
Bronchodilators (27)
Anti-inflammatory (27)
Topical Antifungal (20)

In India where drugs are scarce and the paying capacity is low, a serious effort has never been made to prepare a model list of essential drugs. The 'priority list' drawn by the National Drugs and Pharmaceuticals Development Council does not have any connection with essential drugs, as it was drawn only for the purpose of price control. At present we need to draw a list of essential drugs including acceptable drug combinations for each state and weed out the irrational drug combinations. It can be expected that more than 95% of the drug combinations currently available will have no place in such a list and cost of treatment will reduce considerably.

Medical Education:

It is a pity that there is no time allotted in the medical curriculum for education on essential drugs which is the basis of cost effective treatment and rational drug use. Once a student graduates, he has practically no opportunity for having any continuing education, supervision and review of their prescribing

practices. The chief source of information at this stage is from medical representatives who advocate costly and irrational drug combinations. Another reason for costly and irrational prescribing is the patients who exert pressure on the doctor to prescribe medications for prompt relief of each and every symptom.

BIBLIOGRAPHY

1. Grant GB, Gregory DA, Van Zwanenberg TD. Development of a limited formulary for general practice. The Lancet 4: 1030-1032, 1985.

2. Helling-Borda, M. "The essential drugs concept and its implementation", in "Health in developing countries", international colloquium, organized by the Royal academy of medicine of Belgium, Koninklijke Academie voor Geneeskunde van Belgie, Brussels. 169-186, 1983.

3. Helling-Borda M. "Drug selection a way to better therapy?". Journal of Social and Administrative Pharmacy 1: 124-129, 1983.

4. Joldal B. Selecting drugs on the basis of need, world health forum 6:67-69, 1985.

5. Lauridsen E. "But some are more essential than others." world health 3-5, 1984.

6. Speight AMP. Cost-effectiveness and drug therapy. Tropical doctor 5:89-92, 1975.

7. World Health Organisation. Global strategy for health for all by the year 2000.

8. World Health Organisation. Guidelines for developing national drug policies, 1988.

9. World Health Organisation. The world drug situation, 1988.

ANALGESICS AND ANTIPYRETICS

Actimol (Pharmed)	Phenylbutazone Paracetamol	50.0 mg 500.0 mg	Rheumatoid arthritis
Baralgan (Hoechst)	Analgin Pitofenone HCl Fenpiverinium brom.	500.0 mg 5.0 mg 0.1 mg	Renal, biliary Colic, dysmenorrhoea
Neogene (AFD)	Paracetamol Codeine phosphate Caffeine	500.0 mg 7.5 mg 30.0 mg	Painful conditions, fever
Novigan (Stangen)	Ibuprofen P-piperidino ethoxy-O-Carbmethoxy benzphenone HCl Amide-diphenyl piperidino ethyl acetamide bromo-methylate	400.0 mg 5.0 mg 0.1 mg	Intestinal biliary, renal colics. Dysmenorrhoea Vasomotor headaches, post-partum pain
Pamagin (Alkem)	Analgin Diazepam	500.0 mg 5.0 mg	Aches and pains associated with anxiety, tension, dysmenorrhoea
Proxyvon	Dextro-propoxyphene HCl Acetaminophen	65.0 mg 400.0 mg	Moderate to severe pain
Ultragin (Manners)	Analgin Paracetamol Caffeine	250.0 mg 250.0 mg 25.0 mg	Pain, fever
Zimalgin-A (Rallis)	Analgin Paracetamol Caffeine Codeine phosphate	250.0 mg 250.0 mg 15.0 mg 5.0 mg	Moderate to severe pain

GASTROINTESTINAL DRUGS

Combizym (Neo-Pharma)	Lipase	30.0 mg	Enzyme deficiency dyspepsia,
	Proteases	140.0 mg	
	Amylase	40.0 mg	
	Hemicellulases	30.0 mg	
	Cellulase	70.0 mg	
Entrozyme (Stadmed)	Iodochlorhydro-xyquin	250.0 mg	Amoebic dysentry and summer diarrhoeas
	Diastase	45.0 mg	
	Vitamin B 1	0.3 mg	
	Vitamin B 2	0.3 mg	
	Nicotinamide	4.3 mg	
Enzymex-MPS (IPCA)	Papaine	30.0 mg	Indigestion, flatulence,old age, dyspepsias
	Diastase	125.0 mg	
	Homatropine	1.0 mg	
	Diphenhydramine	20.0 mg	
	Methylpolysiloxane	20.0 mg	
	Niacinamide	20.0 mg	
Festal (Hoechst)	Pancreatin	192.0 mg	Pancreatic insufficiency GI disturbances
	Bile constituents	25.0 mg	
	Hemicellulose	50.0 mg	
Mucaine gel (Wyeth)	Aluminium hydroxide	291.0 mg	Peptic ulcer, heart burn
	Magnesium hydroxide	98.0 mg	
	Oxethazaine	10.0 mg	
Unienzyme (Unichem)	Fungal diastase	200.0 mg	Flatulence, dyspepsia, chronic gastritis
	Papain	30.0 mg	
	Vitamin B 1	2.0 mg	
	Vitamin B 2	2.0 mg	
	Nicotinamide	25.0 mg	
	Acephenolisati n	0.5 mg	
	Diphenhydramine HCl	20.0 mg	
	Homatropine meth. bromide	1.25 mg	
	Methyl polysiloxane	25.0 mg	
	Activated charcoal	75.0 mg	

HORMONES

Geriatone (Wyeth)	Ethinylestradiol	0.01 mg	Hormone-vitamin-iron restorative for forty plus patients
	Methyltestosterone	2.5 mg	
	Vitamin B 1	5.0 mg	
	Vitamin B 12	1.5 mg	
	Folic acid	0.33 mg	
	Vitamin C	50.0 mg	
	Ferrous salt	50.0 mg	
Nepodex (IDPL)	Neomycin	0.5 %	Inflammatory and Infective disorders of the ear.
	Dexamethasone	0.1 %	
	Polymyxin B	0.05 %	
Neurabol-H (Cadila)	Vitamin B 1	60.0 mg	General debility Osteoporosis, wt. loss, refractory anaemia, neuritis.
	Vitamin B 6	27.5 mg	
	Hydroxycobalamine	100.0 mcg	
	Nandrolone	25.0 mg	
Pasuma 'Strong' (Merck)	Methyltestosterone	5.0 mg	Functional impotence, male hypogonadism
	Rac-ephedrine	3.0 mg	
	Vitamin E	3.0 mg	
	Caffeine	15.0 mg	
Trinergic (Unichem)	Methandienone	5.0 mg	Malnutrition & under nutrition, Convalescence, old age, neurological disorders.
	Vitamin B 1	10.0 mg	
	Vitamin B 6	3.0 mg	
	Vitamin B 12	15.0 mcg	

ANTI-INFECTIVE AGENTS

Ampilox (Biochem)	Ampicillin Cloxacillin	250.0 mg 250.0 mg	Respiratory, soft tissue, urinary, bone & joint infections.
Inseptin (IDPL)	Streptomycin Sulfadimidine Berberine HCl Pectin	125.0 mg 250.0 mg 50.0 mg 25.0 mg	G.I. infections due to E.Coli Pseudomonas, Proteus, Shigella.
Jetosec (Ethnor)	Loperamide HCl Streptomycin	1.0 mg 250.0 mg	Acute diarrhoea of bacterial origin in children.
Renokab (Manners)	Streptomycin Neomycin Kaolin Pectin Sodium chloride Pot. chloride Belladonna tinct. Calcium lactate	50.0 mg 25.0 mg 750.0 mg 50.0 mg 25.0 mg 10.0 mg 0.05 ml 10.0 mg	Bacillary dysentry, ulcerative colitis, G.I. surgery
Pheofin (Rallis)	Chloramphenicol Streptomycin Propantheline	125.0 mg 125.0 mg 5.0 mg	Bacterial diarrhoeas
Saril (Rallis)	Streptomycin Pthalyl Sulfa-thiazole Di-iodohydroxyquin Tannic acid Pectin	240.0 mg 200.0 mg 125.0 mg 50.0 mg 10.0 mg	Dysentries of varied etiology

BRONCHO RELAXANTS

Betanton (Glaxo)	Betamethasone	0.25	mg	Allergic asthma
	Chlorpheniramine	2.0	mg	
Broncholax (Alkem)	Diphenhydramine HCl	10.0	mg	Cough, congestion, asthma and other allergic drug conditions.
	Codeine phosphate	10.0	mg	
	Ephedrine HCl	7.0	mg	
	Ammonium chloride	100.0	mg	
	Sodium citrate	150.0	mg	
	Menthol	1.0	mg	
Bronkoplus (Biddle Sawyer)	Salbutamol	2.0	mg	Asthma, bronchitis
	Anh. theophylline	100.0	mg	
Brovon Inhalant (Biddle Sawyer)	Atropine metho-nitrate	0.14	%	Bronchospasm in bronchitis, emphysema
	Papaverine HCl	0.88	%	
	Adrenaline	0.5	%	
	Chlorbutol	0.5	%	
Cortasmyl (Roussel)	Prednisone	1.5	mg	Asthma where bronchodilators alone are ineffective
	Ehedrine HCl	10.0	mg	
	Theophylline	80.0	mg	
	Phenobarbitone	10.0	mg	
Cortophen (Uniloid)	Chlorpheniramine	2.0	mg	Allergic asthma
	Prednisolone	2.5	mg	

IRRATIONAL AND RATIONAL PRESCRIBING

OBJECTIVES:

At the end of the session the participants shall be able to:

1) Define the following terms giving one example each:-

   a) Incorrect prescribing.

   b) Inappropriate prescribing.

   c) Over prescribing.

   d) Multiple prescribing.

   e) Under prescribing.

2. Enumerate five reasons for irrational prescribing.

3. List five methods for promoting rational prescribing.

4. List the functions of the hospital drugs committee.

LEARNING EXPERIENCE:

1. Brief introduction to the topic.

1.1 Group work highlighting the various types of irrational prescribing.

1.2 Plenary session.

EVALUATION:

By observation during group work and presentation at the plenary.

RESOURCES:

1. Handouts.
2. Overhead projector.
3. Extrans and marker pens.
4. Slide projector and slides.

IRRATIONAL AND RATIONAL PRESCRIBING

A. Introduction

Recently, increased attention has been focussed on the irrational drug use. Several studies on the attitude of hospital staff and practitioners on prescribing have been done (Taylor, 1977; Schaffner et al., 1983). Costly and irrational prescribing can be due to various reasons enumerated below. A discussion on these points has been planned in this workshop.

B. Irrational prescribing

1. Reasons for irrational prescribing

This may be due to a variety of reasons such as:

- Lack of training in clinical pharmacology and in basic principles underlying rational drug use.
- Lack of continuing education, supervision and critical review of prescribing practices.
- Promotional activities by pharmaceutical companies.
- Desire for prestige
- Too many patients
- Uncertain diagnosis
- Reliance on their own limited favourable experience with a drug regardless of scientific merit.

2. Types of irrational prescribing

Irrational drug prescribing can occur when the medication prescribed is incorrect, inappropriate, excessive, unnecessary or inadequate (WHO draft, 1985). Examples of each of these are discussed below:

(a) Incorrect prescribing

It can result when the wrong medication is prescribed for the patient e.g. an erroneous diagnosis or inadequate knowledge of the drug. It can also happen when clinical laboratories or other diagnostic facilities are limited or the patients history is inadequate.

Ignorance of drug's actual therapeutic indications or the availability of alternatives that are clearly safer and/or more effective e.g. selection of a newer non-steroid anti-inflammatory drug or a glucocorticoid rather than aspirin for the treatment of rheumatoid arthritis exposes the patient to more expensive medication and may lead to severe side effects.

Selection of an improper route can render the drug ineffective or can be dangerous.

(b) Inappropriate prescribing

This results when the most appropriate medication is not selected. e.g.

An expensive unusual or rarely stocked drug is prescribed in preference to a less expensive or readily available drug.

Prescribing a drug that cannot readily or safely be administered such as i.v. preparation of amphotericin B.

(c) Overprescribing

Includes prescription of a drug that is not needed. A drug given in excessive dose or for too long period of time often in an attempt to reduce the frequency of patient's visits.

(d) Multiple prescribing

It is the use of an unnecessary number of drugs when fewer drugs will produce an equivalent beneficial effect. e.g. prescribing two or more drugs or a multidrug combination products when only one or two drugs are needed.

Use of a drug to counteract adverse effects produced by the primary drug when selection of an alternative primary drug can reduce or eliminate such side effects e.g. ampicillin produces diarrhoea for which antidiarhoeals are used.

(e) Underprescribing

It involves giving inadequate amounts of medication or failure to prescribe a needed drug e.g. withholding medications like morphine in terminally ill patients because of an unreasonable fear of producing opioid dependence.

Prescribing inadequate drug dosage or using medication for an insufficient period of time to treat the patient e.g.

subtherapeutic doses of antibiotics promote the development of bacterial resistance.

Underprescribing is often employed in an attempt to conserve medication for very sick patients or using lower doses to treat more people.

C. Rational prescribing

Methods of promoting rational prescribing:

1. Training and supervision of health workers

Training of the health personnel is a priority in order to improve prescribing practices (Bygberg, 1978).

(a) Physicians: Training to be given to supplement basic pharmacology with more extensive training in clinical pharmacology, including study of efficacy and risks associated with use of drugs as therapeutic agents, drug interactions, economic aspects of prescribing. For medical students training should also include the elements of a rational prescribing.

(b) Medical auxiliaries: They should be given a formal training in clinical pharmacology and therapeutics related to a selected group of drugs. A suitable drug manual should be provided to auxillary workers for the selection of appropriate drugs and dosage regimens. It should include information on warnings, precautions and contraindications. The prescribing practices of the auxillary workers should be reviewed on a regular basis by a supervisor.

2. Drug information

In order to prescribe drugs rationally the health workers must have adequate information on the drugs (Upunda et al., 1983). It should include:

- Generic name
- Pharmacological effects
- Absorption, distribution, metabolism and elimination
- Effectiveness for the condition being treated and its advantage over other drugs
- Adverse effects, precautions and contraindications
- Drug interactions
- Dosage regimen
- Symptoms of poisoning and its treatment
- Cost of the course

3. Hospital drug committee

It may be established in all the hospitals which may perform the following activities in addition to selection of drugs for inclusion in the hospital formulary:

- Establish essential drug availability i.e. drugs are to be made available for each type of health care facility.
- General review and monitoring of prescribing practice.
- Develop standard treatment regimen for local needs.
- Limit prescribing privileges and amount of medication prescribed at single occasion.
- Review drug orders and foster drug education activities.

4. Limitations on prescribing and dispensing

It should be aimed at preventing dispensing practices that may be potentially dangerous and wasteful. The distribution of drugs must be based upon level of use, namely the specific level of sophistication of the health facility and the level of training of the prescriber. A limit may be established on the amount of drug that can be dispensed.

5. Cost sensitization

Prescribers should have a cost consideration. The cost of a single dosage form is less meaningful than the cost of a course of therapy for a period of time.

BIBLIOGRAPHY

1. Bygberg I C. Use of drugs in developing countries. Tropical Doctor 8:174-176, 1978
2. Schaffnes W. et al., Improving Antibiotic prescribing in office practice. JAMA 250:1728-1732, 1983
3. Taylor R J. Towards better prescribing. Journal of the Royal College of General Practitioners 28:263-270, 1978
4. Upunda G. Yudkin J. Brown G. Guidelines to Drug usage. Macmillan Press Ltd., London & Basingston, Macmillan Tropical Commuinity Health manual pp 236, 1983
5. World Health Organisation. National drug policy and rational drug use - a model curriculum (draft). Drug Action Programme, World Health Organisation, pp 95-112, 1985

GROUP WORK ON PRESCRIPTIONS

Some case histories along with the treatment are given below. Discuss among your group. Comment, correct and re prescribe if necessary for these cases.

1. A 35 year old man came with history of yellowish purulent urethral discharge for two days. Gram's stain of urethral exudate showed gram negative diplococci. Patient said that he was allergic to penicillin.
   He was prescribed:
   Cephaloridine inj. 2 gm i.m.

2. A 18 year old girl came with fever, headache and abdominal pain for 3 days. The blood culture was positive for Salmonella.
   She was advised:
   Complete bed rest for 3 weeks
   Chloramphenicol cap. 500 mg q.i.d. x 1 day followed by 250 mg t.d.s. x 6 days
   B. Complex tab. 1 t.d.s. x 7 days
   Vit. C. tab. 500 mg o.d. x 7 days.

3. A 7 year old boy had pain and weakness of left leg for 3 days. He was diagnosed by a private practitioner as a case of poliomyelitis.
   He was prescribed:
   Placentrex inj. 1 amp. x 20 days
   Ampicillin syp. 1 tsf x q.i.d.
   Sioneurons tab. 1 o.d. x 30 days.

4. A 24 year old married female (45 Kg) was recently diagnosed to have pulmonary tuberculosis.
   She was prescribed:
   Rifampicin cap. 450 mg o.d. after meals
   Ethambutol tab. 800 mg o.d.
   INH tab. 300 mg o.d.

   After 3 months of this regimen, she was reported to have pregnancy of 2 weeks duration.
   She was advised to add:
   Fefol cap. 1 o.d.

5. A known cirrohotic (40 years old and ex-alcoholic) came with recent distension of abdomen and night sweats of one month duration.

   On Examination:

   Ascitic fluid showed protein of 3.9 gm/dL and 680 lymphocytes/c.c.

   He was prescribed:
   INH tab. 300 mg o.d.
   Rifampicin cap. 450 mg o.d.
   Ethambutol tab. 800 mg o.d.

6. A patient with a soft sore over the penis and enlarged inguinal lymph node (not suppurated).

   He was prescribed:
   Sulfadimidine tab. 1 g q.i.d. x 7 days

   Three days later the patient came with complaint of painful micturition.

   Urine examination:
   Albumin +++, RBC casts.

   Comment.

7. A 45 year old executive reports with 15 years history of chronic amoebiasis. Stool examination revealed E.H. cysts 14 years ago, but subsequently all tests including barium studies were normal. He had diarrhoea of 3 days duration.

   Per abdomen - colon was palpable in left iliac fossa.

   He was prescribed:

   Dyrade-M tab. 2 t.d.s. x 5 days
   Baralgan tab. 1 t.d.s. x 3 days
   Ampicillin cap. 500 mg q.i.d. x 5 days
   Vitamin C tab. 500 mg o.d.
   Pectokab 15 ml t.d.s. x 5 days.

8. A 13 year old boy (30 Kg) with recurrent mild pain abdomen was found to be clinically normal. The stool examination revealed ascaris and a few hook-worm ova.

   He was prescribed:

   Piperazine citrate tab. 3 gm at night
   Pyrantel pamoate tab. 400 mg.

9. A 45 year old casual labourer had six children. His BP was 150/110 mm Hg. Secondary causes for it were ruled out.

   He was treated with:

   Dytide tab. 1 o.d.
   Aldomet tab. 250 mg q.i.d. x 1 month.

10. A 28 year old sales executive when he was on field duty had BP of 140/110 mm Hg. He had a family history of hypertension. His BP was difficult to control.

    He was prescribed:

    Dytide tab. 1 o.d.
    Inderal tab. 40 mg t.d.s.
    Nepresol tab. 50 mg b.i.d.
    Valium tab. 5 mg h.s.

11. A 50 year old man came with a history of attacks of sub-sternal pain for last one week. The pain was constricting type, came on exertion and relieved by rest.

    On Examination:

    Pulse: 76/mt, regular
    BP : 140/100 mm Hg.
    No cardiovascular or gastro-intestinal system abnormality was detected.
    ECG : Ischaemic changes in inferior leads.

    He was prescribed:

    Metoprolol tab. 100 mg 1 b.i.d.
    Propranolol tab. 80 mg t.d.s.
    Angised tab. s.o.s.
    Myovin ointment
    Sorbitrate tab. 1 t.d.s.
    Dipyridamole tab. 100 mg q.i.d.
    Dispirin tab. 1 t.d.s.
    Peritrate tab. 1 t.d.s.

12. A 25 year old farm labourer reported with general weakness, angular stomatitis and glossitis. His weight was 20% below the normal range and had mild pedal oedema.

    He was prescribed:

    Multivitamin tab. 1 t.d.s.
    Astymin forte cap. 1 t.d.s.
    High protein diet.

13. A 30 year old lathe operator reported with complaints of severe headache, cold, hoarse voice and unproductive cough. He had no fever or lung signs.

Investigations:

TLC : 8,400/cc
DLC : N68 L30 E2

She was prescribed:

Mox cap. 500 mg t.d.s. x 5 days
Otrivin nasal drops q.i.d.
Actifed tab. 1 t.d.s.
Benadryl expectorant 10 ml t.d.s.
Vitamin C tab. 500 mg o.d.
Corbutyl tab. 1 t.d.s.
Dequadin lozenges 1 s.o.s.
Avoid cool drinks for 1 week.

14. A 40 year old bank clerk suffered from bronchial asthma for last 15 years. His BP fluctuated between 130/90 to 200/120 mm Hg. He was advised to take theophylline orally and Brovon aerosol puff whenever needed. But was advised to avoid ephedrine, salbutamol or terbutaline because of the hypertension. He had episodes of high blood pressure which were related to asthmatic attacks. No endocrinal abnormality related to asthma or hypertension was detected during normotensive phase.

Comment and prescribe.

15. A 18 year old girl reported with recurrent aphthous ulcer for which levamisole 150 mg o.d. for 7 days was prescribed. Six days later she presented with symptoms of sore throat and perianal itching.

She was prescribed:

Septran tab. 2 b.d. x 5 days
Vitamin C tab. 500 mg o.d. x 5 days
Xylocaine ointment 5% for perianal application

She was asked to report after 5 days.

16. A 30 year old male teacher presented with a growing patch on his back with severe itching. The margins were raised, spreading and revealed scratch marks.
He was prescribed:
Betnovate-N cream for external use.

17. A 50 year old man was being managed as a case of diabetes mellitus with mild hypertension by two different physicians. He was taking the following medications when he developed a foot injury:

Glibenclamide tab. 2.5 mg t.d.s. after meal
Metformin tab. 25 mg o.d.
Tolbutamide tab. 500 mg whenever Benedicts's test for urine sugar showed yellow or red
Triredisol inj. 1 ml i.m. twice a week
Becosules cap. 1 o.d.
Vitahext 10 ml t.d.s.
Ciplar tab. 20 mg b.d.
Dytide tab. $\frac{1}{2}$ o.d.
Diabetic diet

For his present problem he was asked to add the following drugs:

Oxalgin tab. 1 t.d.s.
Septran DS tab. 1 b.d.

18. A 30 year old female, wife of an industrialist reported with underweight, lassitude and lethargy. Her problems began after a difficult delivery one year ago. Clinically she appeared normal except for extreme loss of weight.

She was prescribed:

Periactin tab. 1 t.d.s. x 30 days
Protinex 5 gms b.d. in milk x 30 days
High protein diet.

19. A 38 year old house wife reported with symptoms of

headache in the evening
palpitations in the morning
frequent loss of temper
indigestion, especially after a good meal
transient, severe lancinating pain over eyebrow or chest lasting for 1 to 2 seconds
bloated feeling especially before menstrual periods.

She was prescribed:

Crocin tab. 500 mg at 4 p.m.
Valium tab. 5 mg at night and 2.5 mg at 7 a.m.
Unienzyme 1 dragee after meal
Migrainil 1 tab. s.o.s. for severe headache
Lasix $\frac{1}{2}$ tab. o.d.

20. A 12 year old patient complained of passing watery stools for 4 days.

On Examination:

Pulse : 92/mt, low in volume
BP : 90/60 mm Hg
Mildly dehydrated
No abnormality detected in cardiovascular, respiratory or gastro intestinal system.

He was prescribed:

Chloromycetin cap. 250 mg q.i.d. x 5 days
Tinidazole tab. 2 gm x 3 days
Diphenoxylate tab. 5 mg q.i.d.
I.V. fluids - 2 litres in 24 hours.

21. A 8 year old boy was brought with severe abdominal pain, constipation and vomiting of one day duration. He passed round worms a day prior to the onset of symptoms. He was a known case of epilepsy receiving gardenal daily.

The following were found on examination:

Weight : 20 Kg.
Afebrile, not dehydrated, not toxic
Per abdomen : Soft, no tenderness, no rigidity, a vague mass was felt to the right of umbilicus.

Treatment:

Siquil inj. 1 ml i.m. stat
Baralgan inj. 1 ml i.m. stat
I.V. fluids
Piperazine citrate 2 tsf at bed time.

22. A 15 day old baby on being bottle fed (as the mother died) was brought with the history of watery diarrhoea of one day duration.

On Examination:

Weight of the child : 3 Kg.
Mild dehydration
Oral thrush was present
Systemic examination was normal
The child was given oral rehydration therapy and sent home.

23. A 6 month old baby was brought with the history of fever, convulsions and not recognising the mother for 6 hours.

On Examination:

Weight : 6 Kg.
Sensorium altered
There were frequent convulsions
Ant. fontanelle bulging
No abnormality detected in cardiovascular or respiratory system.

Investigation:
Fundus: No abnormality

CSF
Gross examination : Turbid
Cell count : 1000 polymorphs
Proteins : 400 mg/dL
Sugar : 30 mg/dL

Blood
Blood sugar : 100 mg/dL

Treatment:

C.P. inj. 2.5 lacs x 6 hrly i.m.
Gentamicin inj. 10 mg x 8 hrly i.m.

24. A 8 year old boy came with history of fever and right sided chest pain which exaggerated on coughing. PA view of x-ray chest showed right sided consolidation. He was diagnosed as a case of pneumococcal pneumonia based on clinical and laboratory investigations.

He was subsequently prescribed:

Dexamethasone tab. 1 tab. x 2 days
Paracetamol tab. 500 mg t.d.s. x 5 days
Mix. cough expectorant 1 oz s.o.s. x 5 days
Calmpose tab. 5 mg at bed time
Terramycin soluble 50 mg t.d.s. x 5 days.

25. An one year old boy had persistent vomiting and watery diarrhoea. He had not passed urine for 2 days.

On Examination:

Weight : 9 Kg.
Dehydration 10%

Treatment:

Siquil inj. 1 ml i.m. stat
Chlorostrep suspension 1 tsf x 6 hrly
Lomotil $\frac{1}{2}$ tab. t.d.s.
Electral forte orally.

26. A mature male baby weighing 3.5 Kg. was delivered by caesarean section. Soon after the birth he was given inj. Vit. K 5 mg i.m. After 4 days he developed jaundice.

Investigation revealed:

Serum bilirubin : 25 mg/dL
Mother's blood group : B positive
Baby's blood group : B positive
Peripheral blood smear : normal
Hb - 20 gm/dl Blood culture - sterile

Treatment:

Phototherapy.

27. A 45 year old lady suffering from hypertension was put on reserpine (0.5 mg/b.i.d.) and hydrochlorthiazide (25 mg o.d.). She developed diarrhoea. Stool examination and culture were inconclusive.

She was prescribed:

Mix. Kaolin 1 oz t.d.s. x 7 days
Ampicillin cap. 500 mg q.i.d. x 7 days
Metronidazole tab. 800 mg t.d.s. x 7 days

28. A 22 year old lady had amenorrhoea of 2 months duration. She wanted to know whether she was pregnant.

A general practitioner prescribed:

E.P. forte inj. 1 amp. i.m.
E.P. forte tab. 1 b.i.d. x 3 days.

Comment.

29. A primigravida with uncomplicated pregnancy of 32 weeks had 11 gms. haemoglobin.

Her obstetrician prescribed as follows:

Raricap cap. 1 o.d.
Becosule cap. 1 o.d.
Probofex syp. 1 tsf at bed time
Calcinol tab. 1 o.d.

After delivery, in order to ensure early recovery and good nutrition.

She was prescribed:

Osto calcium 1 tab. x 1 month
Rediplex 1 tab. b.i.d. x 1 month
Neurobion inj. 1 amp. i.m. on alternate days x 10 days

Comment.

30. A 45 year old hypertensive woman had excessive bleeding per vaginum for a month.

She was prescribed:

Stilbestrol tab. 5 mg o.d. x 21 days.

Comment.

DRUG UTILISATION STUDIES AND PRESCRIBING BEHAVIOUR

OBJECTIVES:

At the end of the session participants shall be able to:

1. Define the term drug utilisation.
2. Identify appropriate and inappropriate use of antimicrobials.
3. List criteria used for determining appropriateness of antimicrobial use.
4. Analyse and comment critically on the pattern of drug use in a hospital and suggest remedial measures.

LEARNING EXPERIENCE:

1. Introduction about the definition, purpose and methodology of drugs utilisation:

1.1 Group task on the appropriateness of antimicrobial use.

1.2 Plenary session.

EVALUATION:

Through observation during group work and presentation of the plenary.

RESOURCES:

1. Handouts.
2. Overhead Projector.
3. Drug Utilisation Proforma from hospital studies.
4. Extrans and marker pens.
5. Slide projector and slides.

DRUG UTILISATION STUDIES AND PRESCRIBING BEHAVIOUR

Appropriate drug utilisation studies are invaluable tools for all involved in drug and health policies and related decision making. They also represent a mechanism for improved communication between health authorities, health personnel and scientists.

Definition:

Drug utilisation is defined as the marketing, distribution, prescription and use of drugs in a society with special emphasis on the resulting medical, social and economic consequences (WHO, 1977).

Objectives:

The basic objective of drug utilisation study is to quantify present usage and possible future demands. Such data can be used for the following:

1) measuring the effects of informational and regulatory measures, price policies etc.
2) defining areas of further investigation.
3) aiding in the determination of benefit and risk as well as cost-effectiveness.
4) indicating overuse, underuse or misuse of single drugs or therapeutic classes of drugs.

Consequences of drug utilisation studies:

The potential consequences of drug utilisation studies are summarised below.

A) Medical:-

Efficacy in preventing, relieving and curing diseases or their complications and symptoms.

Short term and long term adverse effects.

Special risk factors associated with genetics, disease, environment, nutrition, age, sex, pregnancy, lactation etc.

B) Social:-

Current trends in drug and health attitudes.
Drug abuse and dependence.
Disuse of drugs (noncompliance, selection of inappropriate drugs for the purpose).
Discrimination and social injustice (important drugs not available).

C) Economic:-

Drug cost (local production versus import).
Health economy (cost effectiveness of drugs).
National resources (money, manpower, competence and facilities) for the drug and health budget.

Factors influencing drug utilisation:

1) Medical needs and demands (morbidity and expectations).
2) Structure and organisation of the health services (goals and ambitions).
3) General economy (cost of drugs to be purchased).
4) Regulatory efforts (national drug policy).
5) Promotion of drug industries.
6) Professional and public preferences.
7) Sociodemographic, geographical, cultural, and traditional factors.
8) Others e.g. lay press, and mass media.

Study on commonly prescribed drugs:

The use of five major classes of drugs was studied for one year in five teaching and five non-teaching hospitals in Michigan (Sice, 1975). There was no difference regarding use of drugs between these hospitals. The author emphasised the importance of laying stress on teaching the most commonly prescribed drugs (Table 1).

Table 1

Unit	1st major group of drugs	2nd major group of drugs	3rd major group of drugs
Surgery	Fluids & Electrolytes	Antibiotics	Tranquilizers
Obst. & Gynae.	Fluids & Electrolytes	Steroids	Tranquilizers
Medicine	Tranquilizers	Fluids & Electrolytes	Antibiotics
Paediatrics	Antibiotics	Fluids & Electrolytes	Tranquilizers
Neonatology	Antibiotics	Vasopressor	Fluids & Electrolytes

Problems with antimicrobial therapy:

From the previous studies it was established that antimicrobial agents are one of the most frequently prescribed drugs. An analysis of the problems associated with this group of drugs are given below:

1) Multiplicity of antimicrobial agents and their combinations.
2) Interference in diagnosis.
3) Unnecessary prescription.
4) Irrational use (in common cold, surgical prophylaxis).

5) Hazards of therapy (toxicity).

6) Ecological sequelae (resistance, superinfection, veterinary use).

7) Poor compliance.

8) Storage and self medication.

9) Cost of the drug.

10) Rapid acceptance for newer agents.

Reasons for making errors by the prescribing doctors:

1) Prescribing doctors lack the knowledge about drugs.

2) To do something positive (Kunin, 1976).

3) "A drug prescribed out of fear" - an infection may have been overlooked.

4) "A kind of social right" - to receive them for their illnesses (Muller, 1972).

5) "Gentle restraint" reduces the use of toxic and expensive antibiotics.

Kunin's Criteria for determining appropriate and inappropriate use of antimicrobial agents (Kunin et al., 1973):

Determine appropriate and inappropriate use of antimicrobial agents at the hospital as per the criteria given below:

Appropriate:

Category-I:	Agree with the use of antimicrobial therapy/ prophylaxis.
Category-II:	Agree with the use but the advantage derived is controversial (i.e. fatal infection).
Category-II A:	Agree with the use but the use of combination is not justified.

Inappropriate:

Category-III:	A different agent is preferred (less toxic or expensive).
Category-IV:	Dose or duration is inappropriate.
Category-V:	Totally unjustified.

Studies conducted at this Institute:

They are summarised in Tables 2, 3 and 4.

Table 2

Categorisation of antimicrobial use according to Kunin's criteria, a study conducted at JIPMER in 1977.

Sl No.	Speciality	Appro-priate	Inappro-priate	Total		Grand total
1.	Medicine					
	Therapeutic	40	38	78	%	
	Prophylactic	27	3	30	%	108
2.	Surgery					
	Therapeutic	11	11	22	%	
	Prophylactic	37	26	63	%	85
3.	Obst. & Gynae.					
	Therapeutic	3	3	6	%	
	Prophylactic	42	3	45	%	51
4.	Paediatrics					
	Therapeutic	10	8	18	%	
	Prophylactic	5	0	5	%	23
5.	Orthopaedics					
	Therapeutic	6	5	11	%	
	Prophylactic	14	5	19	%	30
6.	Ophthalmology					
	Therapeutic	0	1	1	%	
	Prophylactic	17	2	19	%	20
7.	E.N.T.					
	Therapeutic	0	4	4	%	
	Prophylactic	9	1	10	%	14
	Grand Total	221	110			331

Total number of patients studied = 1658

Table 3

Categorisation of antimicrobial use according to Kunin's criteria, a study conducted at JIPMER in 1987.

Sl No.	Speciality	Appro-priate	Inappro-priate	Total		Grand Total
1.	Medicine					
	Therapeutic	169	20	189	%	260
	Prophylactic	54	17	71	%	
2.	Surgery					
	Therapeutic	117	17	134	%	307
	Prophylactic	135	38	173	%	
3.	Obst. & Gynae.					
	Therapeutic	41	3	44	%	220
	Prophylactic	109	67	176	%	
4.	Paediatrics					
	Therapeutic	105	8	113	%	142
	Prophylactic	25	4	29	%	
5.	Orthopaedics					
	Therapeutic	20	4	24	%	63
	Prophylactic	33	6	39	%	
6.	Ophthalmology					
	Therapeutic	7	12	19	%	59
	Prophylactic	18	22	40	%	
7.	E.N.T.					
	Therapeutic	18	1	19	%	57
	Prophylactic	26	12	38	%	
8.	New borns					
	Therapeutic	9	0	9	%	19
	Prophylactic	10	0	10	%	
	Grand total	896	231			1127

Total number of patients studied = 2008

Table 4
Drug utilisation study of antimicrobial agents: changes noted a decade after

Sl. No.	Drug	% of total number of patients studied 1977	1987
1.	Streptopenicillin	29.3	0.4
2.	Procaine penicillin	27.2	16.4
3.	Crystalline penicillin	23.6	16.0
4.	Streptomycin	16.9	1.9
5.	Chloramphenicol	15.1	9.7
6.	Tetracycline	14.2	2.0
7.	Ampicillin	3.0	49.2
8.	Co-trimoxazole	2.4	20.2
9.	Mandelamine	2.1	0.1
10.	Sulphaphenazole	1.8	0.0
11.	Neomycin	1.8	0.4
12.	Benzathine penicillin	1.5	0.2
13.	Kanamycin	1.5	0.1
14.	Erythromycin	1.2	1.7
15.	Sulfaguanidine	0.9	0.2
16.	Gentamicin	0.9	22.7
17.	Sulfasomidine	0.9	0.0
18.	Sulfadiazine	0.3	0.0
19.	Cloxacillin	0.3	1.9
20.	Amoxycillin	0.0	0.2
21.	Furazolidone	0.0	1.1
22.	Metranidazole	0.0	15.4
23.	Sulphamethaxazole	0.0	0.1
24.	Cephalosporins	0.0	0.7
	Total number of patients receiving antimicrobials	331	1127

BIBLIOGRAPHY

1. Bapna JS. Education on essential drugs and rationlized drug use. Commentary, Clinical Pharmacology and Therapeutics, 1988 (in press).

2. Bapna JS, Shashindran CH, Venkatadri N, Oumachigui Asha. Curriculum for interns on essential drugs and cost-effective prescribing. The Indian Journal of Medical Education 26: 17-24, 1987.

3. Kunin CM, Tupasi T, Craig WA. Use of antibiotics - a brief exposition of the problem and some tentative solutions. Annals of Internal Medicine 79: 555-560, 1973.

4. Kunin CM. Prospects of control of antibiotic usage. In, chemotherapy 4: 299-305

5. Muller C. The overmedicated society: Forces in the market place for medical care. Science 176: 488-492, 1972.

6. Pradhan SC, Shewade DG, Shashindran CH, Bapna JS. Drug Utilisation Studies. The National Medical Journal of India 1: 185-189, 1988.

7. Sice J. Major drug - prescribing patterns in general hospitals. Clinical Pharmacology and Therapeutics 18: 133-138, 1975.

8. World Health Organisation. Technical report series No.615, The selection of essential drugs: Report of a WHO expert committee. Geneva, 1977.

APPENDIX

PROFORMA

Drug Utilisation Studies of Antimicrobial Agents- Retrospective Analysis of Hospitalised Patients of Jipmer, Pondicherry, From January 18 to February 17, 1987.

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1. Name of the patient . .
2. Age & sex . .
3. Clinical Unit . .
4. Hospital No. . .
5. Date of admission . .
6. Date of discharge . .
7. No. of days of hospital stay . .
8. Diagnosis

   a) Provisional . .

   b) Final . .
9. Whether antimicrobial used . . YES / NO
10. If yes,

    - Drug . .
    - Dose . .
    - Frequency . .
    - Route . .
    - Duration . .
    - Antimicrobial combination . .
11. Indication of use . . Therapeutic/Prophylactic
12. Surgical procedures

    a) Pre-operative . .

    b) Post-operative . .
13. Efficacy assessment

    a) Body temperature . .

APPENDIX

PROFORMA (Contd)

13. Efficacy assessment
    b) Patient's progress . .
    c) Lab. investigation . .
14. Side effects noted . .
15. Lab. investigation done
    a) Culture & Sensitivity . .
    b) WBC counts . .
    c) Any other investigations like blood urea & creatinine etc. . .
16. Any other relevant information . .
17. Advice given on discharge . .
18. Other concomitantly administered drugs

SELECTION OF ESSENTIAL DRUGS

OBJECTIVES:

At the end of the session the participants shall be able to:

1) Outline the concept of essential drugs.
2) List the guidelines for selection of essential drugs.
3) List data required for generation of essential drugs list.
4) Formulate essential drugs list for three different levels of health care delivery i.e. teaching hospital, primary health centre and sub-centre.

LEARNING EXPERIENCE:

1) Introduction to criteria for selection of essential drugs:

   1.1. Group task on preparation of essential drugs lists.

   1.2. Plenary session.

EVALUATION:

Through observation during group work and presentation at the plenary.

RESOURCES:

1. Handouts.
2. Overhead Projector.
3. Extrans and marker pens.
4. Slide projector and slides.
5. Chalk and board.

CRITERIA FOR THE SELECTION OF ESSENTIAL DRUGS

BASIC PHILOSOPHY

Essential drugs are those that satisfy the health care needs of the majority of the population; they should therefore be available at all times in adequate amounts and in the appropriate dosage forms.

The choice of such drugs depends on many factors, such as the pattern of prevalent diseases; the treatment facilities; the training and experience of the available personnel; the financial resources; and genetic, demographic, and environmental factors.

Only those drugs should be selected for which sound and adequate data on efficacy and safety are available from adequate clinical studies and for which evidence of performance in general use in a variety of medical settings has been obtained.

Each selected drug must be available in a form in which adequate quality, including bioavailability, can be assured; its stability under the anticipated conditions of storage and use must be established.

Where two or more drugs appear to be approximately similar in the above respects, the choice between them should be made on the basis of a careful evaluation of the relative efficacy, safety, quality, price and availability. In cost comparisons between drugs the cost of the total treatment, and not only the unit cost of the drug, must be considered. In some cases the choice may also be influenced by other factors, such as comparative pharmacokinetic properties, or by local considerations such as the the availability of facilities for manufacture or storage.

In the great majority of cases essential drugs should be formulated as single compounds. Fixed-ratio combination products are acceptable only when the dosage of each ingredient meets the requirements of a defined population group and when the combination provides a proven advantage over single compounds administered separately in therapeutic effect, safety, or compliance.

GUIDELINES

Fundamental Principles

1. Selection of drugs should be based upon established health needs not simply upon professional or public demands.
2. Priorities for selection should be established by and consistent with the national health policy.

The basic philosophy underlying establishment of essential drug list has been outlined in the WHO Technical Report Series No.615: The Selection of Essential Drugs, 1977 (revisions in 1979, 1982 and 1985).

The WHO list is intended to serve as a "model" or "guiding list" which will assist countries in establishing their own priorities and upon which to make their own selection. Since countries differ in their ability to support health services and very fundamental differences exist in the philosophy and nature of economic systems among countries, the establishment of a list should not be imposed upon any country.

A carefully prepared essential drug list is intended to take care of the majority (80-90%) of the health problems in a country that is amenable to drug treatment. The exclusion of other therapeutically equivalent drugs from the list does not mean that they are not useful, safe or effective, but rather that the listed drugs are the ones most needed to satisfy the health needs of the majority of the population. Such drugs should be available in sufficient amounts and in the appropriate dosage forms.

The preparation of a single drug list of uniform international applicability is neither feasible nor possible because of intercountry differences in the health priorities and the characteristics of the population. Each country, therefore, is in the most favourable position to establish its own essential drug list.

Selection is based upon established guidelines and criteria and includes:

a. Relevance to diseases treated at different levels of care or facility
b. Efficacy and safety
c. Cost of treatment regimen
d. Availability

e. Relevance to the level of training of health workers
f. Acceptability to patient
g. Ease of administration
h. Storage considerations

General Guidelines for Establishing a List of Essential-Drugs

Criteria for selection of essential drugs is intended to ensure that the process is unbiased and based upon the best available scientific information, yet take into account variation based upon local needs and requirements.

1. Drug Committee

Great differences in drug needs and requirements exist among countries and it is, therefore, not feasible nor possible to establish a single drug list possessing universal applicability and acceptability. A way to establish a list of drugs that best fit national requirements is to appoint a committee which must include individuals competent in the fields of clinical medicine, pharmacy and pharmacology, as well as allied health workers.

2. Benefit and Safety Evaluations

Drug selection needs to be based upon the objective results obtained in controlled clinical trials and/or epidemiological studies.

3. International Non-proprietary (generic) Names

The INNs are assigned by the World Health Organization through well established procedures and are published periodically in the World Health Chronicle. These generic names for drugs or Pharmaceutical substances, used whenever possible, provide single, simple informative designations for each pharmaceutical substance, are universally known and are independent of the manufacturer or source of that substance. A cross-index of non-proprietary and proprietary names will be helpful to prescribers when a national essential drug list is presented under generic names.

4. Quality

The selected pharmaceutical products have to meet adequate quality control standards, including stability and, when necessary, bioavailability. Where national standards are not available for this type of control, the suppliers must provide documentation of the product's compliance with the requested specifications. The WHO "Certification Scheme on the Quality of Pharmaceutical Products Moving in International Commerce", established in 1975, gives assurance that the product is manufactured under suitable conditions, i.e., in accordance with good manufacturing practices (GMP) and that the manufacturing premises are subject to inspection at suitable intervals. The WHO Certification scheme also records whether or not that product has been approved for marketing in its country of origin.

5. Cost

Cost represents a major consideration in drug selection. In cost comparisons between drugs, the cost of the total treatment and not just the unit cost, must be considered. Sometimes, but not always, there is a direct relationship between drug cost and quality. The lowest priced drug may not be a bargain; if it fails to contain the labelled amount of active ingredient; if it is contaminated; if solid dosage forms (tablets, capsules, suppositories, ampules) are broken when received; if preparations fail to release the active ingredient into the blood in the proper amounts or at the appropriate rate. The cost of non-pharmaceutical therapeutic approaches should also be taken into consideration.

6. Local level of expertise

Local health authorities should decide what level of expertise is required to prescribe, administer, and monitor the safety and adverse effects of single drugs or a group of drugs in a therapeutic category. Consideration should also be given to the competence of local personnel in making a correct diagnosis. In some instances, indivi-

duals with advanced training may be needed for purposes of diagnosis and the initiation of therapy, while individuals with less training could be responsible for maintenance therapy (i.e., level-of-use categories).

7. Local health problems

The influence of local diseases or conditions on pharmacokinetic and pharmacodynamic parameters modifying therapeutic response have to be considered in making the selections, e.g., malnutrition, liver disease.

8. Benefit/risk ratio

When several comparable drugs are available for the same therapeutic indication it is necessary to select the one which provides the most favourable benefit/risk ratio.

9. Preferential factors for evaluating equivalent drugs

When two or more drugs are therapeutically equivalent, preference should be given to:

- the drug which has been most thoroughly investigated and, therefore, best understood with respect to its beneficial properties and limitations;
- the drug possessing clinical utility for the treatment of more than one condition or disease;
- the drug with the most favourable pharmacokinetic properties, e.g., to improve compliance, to minimize risk in various pathophysiological states;
- drugs that are in a dosage form that is easy for the health staff to dispense or easily and safely administered to the patient;
- drugs that are easy for the patient to take;
- drugs, pharmaceutical products and dosage forms with favourable stability under anticipated local conditions for which storage facilities exist;
- drugs for which local, reliable manufacturing facilities exist for its production.

10. Fixed ratio combinations

Fixed ratio combinations are only acceptable if one

or more of the following considerations are satisfied:

- the concomitant value of more than one drug is clinically documented.
- the therapeutic benefit of the combination is greater than the sum of each of the individual components.
- the combination is safer than is the use of an individual drug.
- the cost of the combination product is less than the sum of the individual components.
- compliance is improved by use of the combination.
- sufficient drug ratios are available to permit dosage adjustments that are satisfactory for use by the majority of the population.

11. Periodic review of drug list

The essential drug list may need to be reviewed yearly or whenever necessary, to incorporate significant new therapeutic advances and information.

- Generally new drugs should be introduced only if they offer distinct advantages over drugs previously selected.
- If, on the basis of new information, drugs already on the list are found to no longer possess a favourable benefit/risk ratio, they should be replaced by safer drugs.

Advantages and Limitations of a Limited Drugs List

If implemented according to the concepts and criteria set, and adjusted to the local conditions and priorities, advantages of an essential drug list will clearly outweigh potential limitations as illustrated in Table. Major obstacles to implementing limited lists of drugs may well be of a psychological nature, based upon misconceptions among health professionals as well as the consumers as to the beneficial potential of drugs in the prevention, alleviation and cure of all kinds of disorders and diseases.

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Table 1

ADVANTAGES AND DISADVANTAGES OF LIMITED DRUGS LIST

Advantages	Potential Limitations	Comments
More cost effective drug control, management, purchase, storing, turnover and distribution. (Reduce per unit cost)	Creation of new monopolies (favouring single producers)	Can be counteracted by stimulating competition.
Improved drug use (increased safety, simplified and more efficient drug information including training to health workers).	"Flattening of academic teaching, one sided view, not upto date, stay the same.	By thoroughly focusing on the most relevant issues, the various curricula may well be improved.
Better possibilities to define health needs and to perform programme evaluation.	Lack of interest for drug innovation. Reduced patent protection.	Reduced number of "me too" drugs,not a significant loss
Easy to identify and avoid adverse drug reactions and interactions (reduced number of variables).	Reduced possibilities for gaining episodic experience (new application/ indications etc.)?	Could as well be opposite (reduced complexity at the drug and therapeutic scene).
Stimulation of local drug formulation and production.	Reduced freedom of choice at all levels (promoters, prescribers, consumers, etc).	More rational choice and use may more than compensate this.

PREPARATION OF ESSENTIAL DRUGS LIST

Drug needs can be determined on the basis of:

- Demographic data categorized by sex, age nation, region
  Indices of morbidity

  - Communicable disease statistics

- Mortality statistics (rough indication of morbidity)
- Hospital admission data - categorized by diagnosis (or symptoms)
- Disease pattern surveys
- Data on patient visits to outpatient clinics, primary health facilities, etc
- Pharmaceutical needs for special purposes, e.g.:

  - family planning
  - immunizations
  - malaria, filaria, tuberculosis, leprosy prevention control and prevention of blindness

Health demands versus drug needs:

- Ideally health demands and drug needs should be equivalent, but in actuality this is often not the case
- Reasons for discrepancy - health needs show the population at large, while health demands are primarily represented by more affluent population, living in urban areas and having ready access to medical care, hospitals and pharmacies.
- Leading therapeutic classes, based upon retail pharmacy sales, for selected developed and developing countries, appear in Table 2-4.

Table 2

COMPARATIVE RANKINGS OF THE LEADING TEN THERAPEUTIC CLASSES IN SELECTED DEVELOPED AND DEVELOPING COUNTRIES (1979)

Therapeutic Class	Brazil	Philippines	USA	W.Germany	India
Analgesics	6	4	2	5	6
Antacids	-	10	-	-	8
Antianemics	-	-	-	-	7
Antiasthmatics	-	7	-	-	-
Antibiotics	1	1	3	7	1
Antidiabetics	-	-	-	10	-
Antidiarrheals	-	8	-	-	-
Antiparasitics	-	-	-	-	9
Antirheumatics	7	-	9	-	5
Antispasmodics	4	-	-	-	-
Cardiac therapy	-	-	-	1	-
Cholagogues	10	-	-	-	-
Cough & cold	2	2	4	4	4
Diuretics	-	-.	7	-	-
Hypotensives	-	-	6	8	-
Nutrients	-	6	-	-	3
Psychoanaleptics	9	-	10	-	-
Psycholeptics	8	-	1	2	-
Sex hormones	5	-	8	9	-
Systemic steroids	-	-	-	-	10
Topical steroids	-	9	-	-	-
Tuberculostatics	-	5	-	-	-
Vasodilators	-	-	-	3	-
Vasoprotectives	-	-	-	6	-
Vitamins	3	3	5	-	2

Table 3

Percentage of drug sales for each major therapeutic class by region (1983 and 1985)

Therapeutic class	USA		Europe		Japan		Rest of the world	
	1983	1985	1983	1985	1983	1985	1983	1985
Cardiovascular	19.1	20.8	22.9	24.3	12.2	13.6	12.9	13.5
Anti-infective	15.1	15.0	16.1	13.8	23.8	21.2	17.8	19.2
Intl. medicine	17.4	17.0	11.6	11.9	13.1	13.1	15.7	15.8
Analgesics	11.9	11.5	13.0	13.5	9.5	8.6	16.1	14.6
Respiratory	4.3	4.0	7.6	7.9	3.2	4.6	9.4	9.1
Mental health	9.9	10.4	9.0	8.4	10.3	10.3	3.2	2.7
Nutritional	7.6	6.8	9.1	8.9	12.4	13.5	5.0	5.0
Others	14.7	14.5	10.7	11.3	15.5	15.1	19.9	20.1

Table 4

Percentage of world drug sales for each major therapeutic class

Therapeutic class	1975	1980	1983	1984	1985
Cardiovascular	14.0	16.1	16.8	17.3	18.1
Anti-infective	17.6	18.0	17.6	17.6	17.1
Internal medicine	15.9	14.6	14.5	14.5	14.6
Analgesics	15.0	13.6	13.5	13.2	12.9
Respiratory	8.5	7.8	7.1	6.9	7.1
Mental health	8.3	7.7	7.1	7.1	6.9
Nutritional	6.7	7.3	7.7	7.6	7.6
Others	14.0	14.9	15.7	15.8	15.7

PATIENT EDUCATION IN EFFECTIVE DRUG USE

An effcient drug supply system is of no use if the patient fails to take the drug as directed.

Compliance

Compliance: the degree to which the patient follows medical advice and takes the prescribed medication as directed. This implies that the patient must take the correct drug, in the correct dose, at the appropriate frequency or intervals between doses and for the recommended duration.

1. Factors affecting compliance

Studies in developed and developing countries show a noncompliance rate of 50%. Prescribers generally overestimate the true extent of the patient's compliance.

(a) Patient characteristics

- age extremes: over 65 and very young
- social isolation
- absence of family support
- lower socioeconomic class
- lower educational level
- cost of medication: inability to afford medication or entire course of therapy
- personal or cultural health beliefs

(b) Patient-health care interactions

- failure to effectively communicate or misunderstanding of directions
- patient dissatisfaction with prescriber or provider of health care services (perceived as negative, cold, nonsupportive, disinterested, condescending)
- language, cultural or other communication barrier between patient and prescriber
- absence of patient confidence in prescriber or value of medication prescribed.

(c) Disease

- long term therapy (seizures, tuberculosis)
- prophylaxis (malaria)
- absence of symptoms or benefits of therapy uncertain
- psychiatric diseases
- acute diseases where patient feels better after one or two days (infectious disorders)

(d) Medication

- multiple medications (noncompliance with 3 drugs is twice as high as in those taking one drug)
- frequent doses
- complexity of dosage regimen
- duration of therapy
- drug-induced side effects (e.g., impotency associated with antihypertensive medication)
- unattractive packaging reducing patient's confidence
- multiple drugs which look-alike e.g. unmarked tablets.

2. Measures of evaluating compliance

Medication counts

- Determine quantity of medication (number of tablets, capsules, ounces) remaining after a given time.

Drug measurement in biological fluids e.g. urine, blood

3. Noncompliance

Noncompliance may result in:

(a) Interference with proper therapeutic management

- delay treatment or recovery
- cause prescriber to assume that the initial drug chosen was inappropriate or the diagnosis incorrect

(b) Drug-related toxicity

Physician may increase drug dosage to obtain a more satisfactory response or prescribe an alternative drug that is more potent and sometimes more toxic.

(c) Increased risk to public health

Failure to treat communicable diseases, e.g., tuberculosis, syphilis, gonorrhea, malaria.

Patient Education and Medication Compliance

Patient education is not the exclusive responsibility or domain of any health care provider. Depending upon the national customs, local conditions, or availability of health care workers at a given time, patient education may be provided by the physician, nurse, pharmacist, health assistant or auxiliary, community health worker or student.

Where the functions of prescribing and dispensing are performed by different individuals, to avoid potential conflict, the roles of each should be carefully delineated - e.g., the prescriber may be responsible for explaining the illness and prognosis to the patient, while the dispenser may provide medication-related information.

1. Factors promoting compliance:

- prescriber has effectively communicated to the patient the appropriate use of and need for the medication
- prescriber is perceived by the patient to be interested, sympathetic and understanding and has confidence in the effectiveness of the prescribed medication
- use of medication is compatible with patient's life style and culture, taking into account the nutritional status and diet of the patient, e.g. not prescribing a drug 3 times daily when patient has only two meals
- few drugs are prescribed
- doses and dosing intervals are few
- dosing regimen is simple, e.g., with each meal or at bedtime
- side effects are minimal

2. Strategies for patient education in better compliance:

The patient should generally be provided adequate information about the nature and prognosis of the illness. In general the informed patient more actively participates in his/her treatment and better complies with recommendations.

In regard to the prescribed drug the patient should be told:

- the name of medication

- how and when the drug is to be taken (verbal instructions should be supplimented with written or symbolic instructions that accompany the drug)
- the anticipated effects of the drug in the management of the disease and why compliance is necessary
- the nature of possible side effects and what the patient should do about them, e.g., practical methods of minimizing these effects, e.g., take medication with meals or at bed time
- precautions to be observed while taking medication, e.g., the foods, drinks (alcohol), other medicines, including traditional medications, and activities to be avoided when taking the medication.

Community Education on Safe and Rational Drug Use

Education of the general public through mass media, school activities, posters, etc., are important tools to increase general public awareness on appropriate drug use and discourage drug misuse/abuse.

Patients should be made aware that non-prescription drugs as well as traditional medicines (herb) may have adverse and unwanted side effects. Patient should be taught to inform prescribers about all drugs (prescribed and non-prescription drugs) they are using so that possible interactions will not be overlooked.

BIBLIOGRAPHY

1. Brudon-Jakobowics P. Where the tom-tom beats World Health 20-21, July 1084.
2. Michel JM. Why do people like medicines? A perspective from Africa, The Lancet 1:210, 1985.
3. Report of an Informal Working Group on Educational Material for Patients, DAP/85.10.
4. Sacket DL., Haynes, RB. Compliance with therapeutic regimens. Johns Hopkins University Press, 1976.
5. Van der Geest S. "Anthropology and pharmaceuticals in developing countries", Medical Anthropology Quarterly, 15: 59-60, 1984.

Appendix-I

CAUSE-WISE MORBIDITY STATISTICS, OUT-PATIENT DEPARTMENTS, 1987

(International Classification of Diseases, W.H.O)

ICD No.	Cause of Morbidity	No. of cases
001-009	Intestinal infectious diseases	5593
010-019	Tuberculosis	6088
020-027	Zoonotic bacterial diseases	1
030-041	Other bacterial diseases	1237
045-049	Poliomyelitis and other non-arthropod-borne viral diseases of the CNS	1192
050-057	Viral diseases accompanied by exanthema	430
060-066	Arthropod-borne viral diseases	8
070-079	Other diseases due to viruses and chlamydia	2615
080-088	Rickettsial and other arthropod-borne viruses	355
090-099	Syphilis and other venereal diseases	452
100-104	Other spirochetal diseases	3
110-118	Mycoses	4097
120-129	Helmenthiasis	5258
130-136	Other infections and parasitic diseases	2992
137-139	Late effects of infectious and parasitic diseases	305
140-149	Malignant neoplasm of lip, oral cavity and pharynx	665
150-159	Malignant neoplasm of GIT and peritoneum	416
160-169	Malignant neoplasm of respiratory and intrathoracic organs	133
170-175	Malignant neoplasm of bones connective tissues, skin and breast	341
179-189	Malignant neoplasm of genito-urinary organs	1415
190-199	Malignant neoplasm of other and unspecified sites	383

ICD No.	Cause of Morbidity	No. of cases
200-209	Malignant neoplasm of lymphatic and haematopoietic tissues	262
210-229	Benign neoplasm	855
230-234	Carcinoma in situ	75
239	Neoplasm of unspecified nature	120
240-246	Disorders of thyroid gland	489
250-259	Diseases of endocrine gland	1009
260-269	Nutritional deficiencies	1539
270-279	Other metabolic disorders and immunity disorders	672
280-289	Diseases of blood and blood forming organs	4028
290-294	Organic psychotic conditions	62
295-299	Other psychoses	889
300-316	Neurotic disorders, personality disorders and other non-psychotic disorders	1560
317-319	Mental retardation	166
320-326	Inflammatory diseases of CNS	292
330-337	Hereditary and degenerative diseases of CNS	247
340-349	Other diseases of the CNS	1516
350-359	Disorders of peripheral system	708
360-379	Disorders of eye and adnexa	3099
380-389	Diseases of ear and mastoid process	8121
390-392	Acute rheumatic fever	116
393-398	Chronic rheumatic heart disease	1440
401-405	Hypertensive heart disease	925
410-414	Ischaemic heart disease	465
415-417	Disease of pulmonary circulation	781
420-429	Other forms of heart disease	1351
430-438	Cerebro-vascular disease	361
440-448	Disease of arterioles and capillaries	117
451-459	Diseases of veins, lymphatics and other diseases of circulatory system	1004
460-466	Acute respiratory infections	20624
470-478	Other diseases of upper respiratory tract	5374

ICD No.	Case of Morbidity	No. of cases
480-487	Pneumonia and influenza	890
490-496	Chronic obstructive pulmonary disease and allied conditions	3955
500-508	Pneumoconioses and other lung diseases due to external agents	49
510-519	Other diseases of respiratory system	1828
520-529	Diseases of oral cavity, salivary glands and jaws	8276
530-537	Diseases of oesophagus, stomach and duodenum	11307
540-543	Appendicitis	127
550-553	Hernia of abdominal cavity	1245
555-558	Non-infective enteritis and colitis	154
560-569	Other diseases of intestines and peritoneum	1037
570-579	Other diseases of digestive system	1263
580-589	Nephritis, nephrotic syndrome and nephrosis	593
590-599	Other diseases of urinary system	1127
600-608	Diseases of male genital organs	2735
610-611	Disorders of breast	276
614-616	Inflammatory diseases of female genital organs	532
617-629	Other disorders of female genital tract	2843
630-639	Pregnancy with abortive outcome	372
640-648	Complications mainly related to pregnancy	221
650-659	Normal delivery and other indications for care in pregnancy labour and delivery	77
660-669	Complications occurring mainly in the course of labour and delivery	46
670-676	Complications of puerperium	56
680-686	Infections of skin and sub-cutaneous tissue	6751
690-698	Other inflammatory conditions of skin and subcutaneous tissue	3901
700-709	Other diseases of skin and subcutaneous tissue	3722
710-719	Arthropathies and related conditions	2191

ICD No.	Cause of Morbidity	No. of cases
720-724	Dorsopathies	2368
725-729	Rheumatism excluding the back	15339
730-739	Osteopathies, chondropathies and acquired musculo-skeletal deformities	847
740-759	Congenital anomalies	2342
760-779	Certain conditions originating in the perinatal period	2262
780-789	Miscellaneous symptoms	2469
790-796	Nonspecific abnormal findings	44
800-804	Fracture of skull	92
805-809	Fracture of neck and trunk	185
810-819	Fracture of upper limb	468
820-829	Fracture of lower limb	449
830-839	Dislocation	63
840-848	Sprains and strains of joints and adjacent muscles	193
850-854	Intracranial injury excluding those with skull fracture	158
860-869	Internal injury of chest, abdomen and pelvis	69
870-879	Open wound of head, neck and trunk	225
880-887	Open wound of upper limb	155
900-904	Injury to blood vessels	3
905-909	Late effects of injury, poisoning and toxic effects and external causes	19
910-919	Superficial injury	276
920-924	Contusion with intact skin surface	190
925-929	Crush injury	79
930-939	Effects of foreign body entering through orifice	242
940-949	Burns	187
950-957	Injury to nerves and spinal cord	59
958-959	Certain traumatic complications and unspecified injuries	914
960-979	Poisoning by drugs, medicament and biological substances	85
980-989	Toxic effects of substances chiefly nonmedical as to source	270
990-995	Other unspecified effects of external causes	54

ICD No.	Cause of Morbidity	No. of cases
996-999	Complications of surgical and medical care	69
V01-V07	Persons with potential hazards related to communicable diseases	16
V20-V28	Persons encountering health services in circumstances related to reproduction and development	4274
V30-V39	Healthy live-born infants according to type of birth	2
V40-V49	Persons with a condition influencing their health status	8
V50-V59	Persons encountering health services for specific procedures and after care	31
V60-V68	Persons encountering health services in other circumstances	92
V70-V82	Persons without reported diagnosis encountered during examination and investigations of individual	1

Appendix-II

CAUSE-WISE MORBIDITY STATISTICS,

TEACHING HOSPITAL INPATIENTS, 1985

(International Classification of Diseases, W.H.O)

ICD No.	Cause of Morbidity	No. of cases
001-009	Intestinal infectious diseases	1364
010-019	Tuberculosis	826
020-027	Zoonotic bacterial diseases	1
030-041	Other bacterial diseases	611
045-049	Poliomyelitis and other non-arthropod-borne viral diseases of the CNS	248
050-057	Viral diseases accompanied by exanthema	115
060-066	Arthropod-borne viral diseases	Nil
070-079	Other diseases due to viruses and chlamydia	248
080-088	Rickettsial and other arthropod-borne viruses	60
090-099	Syphilis and other venereal diseases	93
100-104	Other spirochetal diseases	1
110-118	Mycoses	69
120-129	Helminthiasis	213
130-136	Other infections and parasitic diseases	36
137-139	Late effects of infectious and parasitic diseases	128
140-149	Malignant neoplasm of lip, oral cavity and pharynx	166
150-159	Malignant neoplasm of GIT and peritoneum	309
160-169	Malignant neoplasm of respiratory and intrathoracic organs	94
170-175	Malignant neoplasm of bones, connective tissues, skin and breast	291
179-189	Malignant neoplasm of genito-urinary organs	424
190-199	Malignant neoplasm of other and unspecified sites	252

ICD No.	Cause of Morbidity	No. of cases
200-209	Malignant neoplasm of lymphatic and haematopoietic tissues	350
210-229	Benign neoplasm	321
230-234	Carcinoma in situ	8
235-239	Neoplasm of unspecified nature	91
240-246	Disorders of thyroid gland	234
250-259	Diseases of endocrine glands	716
260-269	Nutritional deficiencies	257
270-279	Other metabolic disorders and immunity disorders	743
280-289	Diseases of blood and blood forming organs	458
290-294	Organic psychotic conditions	33
295-299	Other psychoses	157
300-316	Neurotic disorders, personality disorders and other non-psychotic disorders	181
317-319	Mental retardation	17
320-326	Inflammatory diseases of CNS	245
330-337	Hereditary and degenerative diseases of CNS	170
340-349	Other diseases of the CNS	492
350-359	Disorders of peripheral system	188
360-379	Disorders of eye and adnexa	1267
380-389	Diseases of ear and mastoid process	316
390-392	Acute rheumatic fever	50
393-398	Chronic rheumatic heart disease	Nil
401-405	Hypertensive heart disease	198
410-414	Ischaemic heart disease	387
415-417	Diseases of pulmonary circulation	313
420-429	Other forms of heart disease	971
430-438	Cerebro-vascular disease	289
440-448	Disease of arterioles and capillaries	85
451-459	Diseases of veins, lymphatics and other diseases of circulatory system	240
460-466	Acute respiratory infections	215
470-478	Other diseases of upper respiratory tract	299
480-487	Pneumonia and influenza	632
490-496	Chronic obstructive pulmonary disease and allied conditions	444
500-508	Pneumoconioses and other lung diseases due to external agents	53
510-519	Other diseases of respiratory system	476
522-529	Diseases of oral cavity, salivary glands and jaws	94

ICD No.	Cause of Morbidity	No. of cases
530-537	Diseases of oesophagus, stomach and duodenum	694
540-543	Appendicitis	163
550-553	Hernia of abdominal cavity	599
555-558	Non-infective enteritis and colitis	80
560-569	Other diseases of intestines and peritoneum	562
570-579	Other diseases of digestive system	707
580-589	Nephritis, nephrotic syndrome and nephrosis	399
590-599	Other diseases of urinary system	448
600-608	Diseases of male genital organs	605
610-611	Disorders of breast	49
614-616	Inflammatory diseases of female genital organs	96
617-629	Other disorders of female genital tract	970
630-639	Pregnancy with abortive outcome	353
640-648	Complications mainly related to pregnancy	629
650-659	Normal delivery and other indications for care in pregnancy, labour and delivery	2524
660-669	Complications occurring mainly in the course of labour and delivery	372
670-676	Complications of puerperium	78
680-686	Infections of skin and subcutaneous tissue	417
690-698	Other inflammatory conditions of skin and subcutaneous tissue	166
700-709	Other diseases of skin and subcutaneous tissue	230
710-719	Arthropathies and related conditions	256
720-724	Dorsopathies	148
725-729	Rheumatism excluding the back	147
730-739	Osteopathies, chondropathies and acquired musculo-skeletal deformities	275
740-759	Congenital anomalies	974
760-779	Certain conditions originating in the perinatal period	2556
780-789	Miscellaneous symptoms	598
790-799	Nonspecific abnormal findings	23
800-804	Fracture of skull	63
805-809	Fracture of neck and trunk	133
810-819	Fracture of upper limb	230
820-829	Fracture of lower limb	330
830-839	Dislocation	73

ICD No.	Cause of Morbidity	No. of cases
840-848	Sprains and strains of joints and adjacent muscles	9
850-854	Intracranial injury excluding those with skull fracture	256
860-869	Internal injury of chest, abdomen and pelvis	117
870-879	Open wound of head, neck and trunk	97
880-887	Open wound of upper limb	35
890-899	Open wound of lower limb	11
900-904	Injury to blood vessels	4
905-909	Late effects of injury, poisoning and toxic effects and external causes	2
910-919	Superficial injury	3
920-924	Contusion with intact skin surface	42
925-929	Crush injury	47
930-939	Effects of foreign body entering through orifice	86
940-949	Burns	108
950-957	Injury to nerves and spinal cord	22
958-959	Certain traumatic complications and unspecified injuries	78
960-979	Poisoning by drugs, medicament and biological substances	56
980-989	Toxic effects of substances chiefly non-medical as to source	303
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Appendix III

LIST OF DRUGS AVAILABLE IN A TEACHING HOSPITAL PHARMACY

1987

Sl	Nomenclature	Specification	Approx annual requirements in thousands	Rate per hundred Rs.
1	2	3	4	5
	TABLETS, CAPSULES, GRANULES			
1.	Acetylsalicylic acid tab.	300 mg	1500	3
2.	Acetazolamide tab.	250 mg	20	30
3.	Aminophylline tab.	100 mg	30	8
4.	Amitriptyline tab.	25 mg	65	12
5.	Ampicillin anhydrous cap.	250 mg	250	60
6.	Analgin tab.	500 mg	240	12
7.	Bephenium hydroxy-naphthoate sachet	5 gm	7	195
8.	Busulphan tab.	0.5 mg	1	67
		2 mg	1	100
9.	Calcium gluconate with Vitamin C & D tab.	500 mg + 15 mg + 100 I.U.	150	9
10.	Carbimazole tab.	5 mg	9	45
11.	Carbamazepine	200 mg	9	153
12.	Chloramphenicol cap.	250 mg	250	40
13.	Chlorpheniramine maleate tab.	4 mg	500	1
14.	Chlorpromazine HCl tab.	25 mg	9	7
		50 mg	30	12
		100 mg	100	17
		200 mg	50	29
15.	Chlorambucil tab.	2 mg	1	26
		5 mg	1	59
16.	Chlorpropamide tab.	100 mg	60	9
17.	Chloroquine phosphate tab.	250 mg	30	22
18.	Clofazimine cap.	100 mg	12	130
19.	Cloxacillin cap.	250 mg	20	125
20.	Clotrimazole tab.	100 mg	35	57

1	2	3		4	5
21.	Co-trimoxazole tab.	80:400	mg	35	30
		160:800	mg	72	60
22.	Cyclophosphamide tab.	50	mg	5	72
23.	Cyproheptadine HCl tab.	4	mg	3	21
24.	Dapsone tab.	10	mg	24	2
		25	mg	10	3
		50	mg	80	4
		100	mg	100	6
25.	Diazepam tab.	500	mg	120	1
26.	Diethylcarbamazine tab.	50	mg	50	4
		100	mg	150	7
27.	Digoxin tab.	0.25	mg	70	9
28.	Digene tab.			300	4
29.	Dimethindene maleate tab.	1	mg	6	11
30.	Dihydralazine sulphate tab.	25	mg	30	8
31.	Dimethylpolysiloxane tab.	40	mg	3	13
32.	Disulfiram tab.	250	mg	0.5	60
33.	Doxepin HCl cap.	25	mg	12	40
34	Erythromycin stearate tab.	100	mg	10	45
		250	mg	60	90
35.	Ethambutol tab.	400	mg	480	63
		800	mg	240	81
36.	Ethionamide tab.	125	mg	4	86
37.	Ferrous sulphate tab.	200	mg	1800	2
38.	Folic acid tab.	5	mg	60	6
39.	Furazolidine tab.	100	mg	30	6
40.	Frusemide tab.	40	mg	120	9
		100	mg	5	18
		500	mg	2	45
41.	Dichlor-8-hydroxy-quinoline tab.	200	mg	12	3
42.	Glibenclamide tab.	500	mg	42	5
43.	Glyceryltrinitrate tab.	0.5	mg	6	7
44.	Griseofulvin tab.	125	mg	12	29
45.	Haloperidol tab.	0.25	mg	30	6
		1.5	mg	24	12
		5	mg	30	30
		10	mg	15	25
46.	Hydrochlorthiazide tab.	50	mg	60	9
47.	Imipramine HCl tab.	25	mg	50	12

1	2	3		4	5
48.	Ibuprofen tab.	200	mg	60	15
49.	Indapamide tab.	2.5	mg	2	21
50.	Indomethacin tab.	50	mg	3	45
51.	Iopanic acid tab.	500	mg	2000	250
52.	Isoniazid tab.	100	mg	300	4
		300	mg	300	10
53.	Isoniazid +	300	mg		
	Thiacetazone tab.	150	mg	84	20
54.	Isoxuprine tab.	10	mg	7	19
55.	Isosorbide dinitrate tab.	10	mg	5	8
56.	Labetalol tab.	50	mg	6	65
57.	Levodopa tab.	500	mg	0.5	200
58.	Lithium carbonate tab.	150	mg	84	35
59.	Lorazepam tab.	1	mg	7.5	20
60.	Comp. Magnesium tri-				
	silicate NF tab.	500	mg	700	2
61.	Mebendazole tab.	100	mg	24	10
62.	Methotrexate tab.	2.5	mg	4	1000
63.	Metronidazole tab.	200	mg	250	10
		400	mg	12	20
64.	Mercaptopurine tab.	50	mg	1	90
65.	Metheneamine mandelate				
	tab.	500	mg	3	26
66.	Methyldopa tab.	250	mg	18	75
67.	Methylergometrine				
	maleate tab.	0.125	mg	3.5	30
68.	Metoclopramide tab.	10	mg	12	11
69.	Metoprolol tab.	100	mg	18	50
70.	Nicotonic acid tab.	50	mg	7	2
71.	Neomycin sulphate tab.	350	mg	12	1
72.	Nifedipine cap.	5	mg	8	18
		10	mg	8	25
		20	mg	8	40
73.	Nitrofurantoin +	100	mg		
	Deglycyrrhizinised	250	mg	16	30
	Liquorice tab.				
74.	Nitrazepam tab.	5	mg	35	11
75.	Amoxycillin cap.	250	mg	180	130
76.	Doxycyline cap.	100	mg	25	225

1	2	3		4	5
77.	Orphenadrine tab.	50	mg	35	37
78.	Oxyphenbutazone tab.	100	mg	400	39
79.	Oxytetracycline HCl. cap.	250	mg	500	59
80.	Paracetamol tab.	500	mg	250	6
81.	Paraformaldehyde tab.	1	gm	4	29
82.	Phenindione tab.	50	mg	1	26
83.	Phenobarbitone tab.	15	mg	60	1
		30	mg	15	4
		60	mg	175	6
84.	Phenytoin sodium tab.	100	mg	125	13
85.	Phenoxymethyl penicillin tab.	125	mg	200	33
86.	Phthalylsulphathiazole tab.	120	mg	200	33
		500	mg	90	50
87.	Prednisolone tab.	5	mg	300	15
		10	mg	200	25
88.	Primidone tab.	250	mg	25	46
89.	Propantheline bromide tab	15	mg	1	70
90.	Prochlorperazine HCl tab.	5	mg	60	5
		25	mg	1	8
91.	Piperazine phosphate tab.	500	mg	5	16
92.	Promethazine HCl tab.	25	mg	20	25
93.	Propranolol HCl tab.	10	mg	24	5
		40	mg	36	9
		80	mg	6	15
94.	Psoraline tab.	5	mg	6	25
95.	Pyrazinamide tab.	500	mg	72	80
96.	Quinidine sulphate tab.	200	mg	12	54
97.	Quinidochlor tab.	0.25	mg	100	9
98.	Rifampicin cap.	150	mg	300	53
		300	mg	65	111
		450	mg	150	116
99.	Reserpine +	0.1	mg	1	9
	Dihydralazine tab.	10	mg		
100.	Reserpine tab	0.25	mg	1	9
101.	Salbutamol tab.	2	mg	30	4
		4	mg	240	5
		8	mg	10	7
102.	Sodium valproate tab.	200	mg	4	70

1	2	3		4	5
103.	Stilbesterol tab	1	mg	7	5
		5	mg	4	10
104.	Sulphaphenazole tab.	500	mg	300	20
105.	Sulphamoxole tab.	500	mg	3000	40
106.	Sulphadimidine tab.	500	mg	300	18
107.	Sulphamethizole tab.	500	mg	2	51
108.	Spironolactone tab.	25	mg	6	90
109.	Salicylazosulphapyridine tab.	500	mg	1	40
110.	Tetracycline HCl cap.	250	mg	350	31
111.	Terbutaline tab.	5	mg	4	36
112.	Thiacetazone tab.	50	mg	60	2
		150	mg	6	5
113.	Thioridazine tab.	25	mg	36	5
		100	mg	36	440
114.	Thyroxine sodium tab.	0.1	mg	18	5
115.	Tinidazole tab.	300	mg	6	89
116.	Tolbutamide tab.	500	mg	48	15
117.	Trifluperazine tab.	1	mg	3	5
		5	mg	60	9
		10	mg	5	47
118.	Trihexyphenidyl HCl. tab.	2	mg	72	3
119.	Verapamil tab.	40	mg	5	56
120.	Vitamin A cap.	50000	IU	6	10
121.	Vitamin A +	6000	IU		
	Vitamin D cap.	1000	IU	240	5
122.	Vitamin B1 tab	100	mg	6	8
123.	Vitamin B2 tab	50	mg	42	9
124.	Vitamin B6 tab	50	mg	24	12
125.	Vitamin C tab	100	mg	150	6
		500	mg	250	20
126.	Vitamin B Complex NFI tab			4000	4

1	2	3		4	5
	INJECTION				
1.	Adrenaline tartrate amp	1	mg	10	65
2.	Aminoacids essential	200	mg	0.1	7200
3.	Aminophylline amp	250	mg	6	110
4.	Ampicillin vial	500	mg	36	340
5.	Analgin amp	500	mg	24	142
6.	Anti diptheria serum amp	10000	IU	0.3	3614
7.	Anti gas gangrene serum amp	4000	IU	0.1	1010
8.	Anti tetanus toxoid human Immunoglobulins	250	IU	1.2	3300
		500	IU	1.2	7500
9.	Atropine sulphate amp	0.65	mg	25	25
10.	Benzathine penicillin L.A. vial	6 lacs	U	12	213
		12 lacs	U	1	657
		24 lacs	U	20	172
11.	Benzyl penicillin vial	5 lacs	U	20	172
		10 lacs	U	60	237
12.	Calcium gluconate 10% amp	10	ml	24	142
13.	Carbenicillin vial	1	gm	1900	806
14.	Chlorpheniramine maleate amp	10	mg	6	44
15.	Chloramphenicol succinate vial	1	gm	6	625
16.	Chlorpromazine HCl. amp	50	mg	2.4	92
17.	Chloroquine phosphate vial	64.5	mg	0.1	750
18.	Cisplatin vial	10	mg	1	4680
19.	Cloxacillin vial	250	mg	10	450
20.	Co-trimoxazole amp	160:800	mg	3.6	1945
21.	Cyclophosphamide vial	200	mg	39	676
22.	Dehydroemetine amp	30	mg	1	400
23.	Dexamathasone sodium amp	4	mg	4.8	325
24.	Dextran 40 10% in 5% dextrose	540	ml	1	5600
	in normal saline	540	ml	1	4500
25.	Dextrose 5% bottle	540	ml	10	770
	10% bottle	540	ml	6	860
	25% amp	25	ml	72	172
	50% amp	25	ml	2.4	200

1	2	3		4	5
26.	Diazepam amp	10	mg	12	80
27.	Digoxin amp	0.5	mg	0.15	147
28.	Dopamine amp	200	mg	3	7200
29.	Epsilon aminocaproic acid amp	250	mg	0.1	50
30.	Frusemide amp	20	mg	18	64
		250	mg	2.4	715
31.	5-Fluorouracil amp	250	mg	2.4	595
32.	Gentamicin sulphate vial	20	mg	6	80
		80	mg	24	232
33.	Haloperidol amp	5	mg	1.2	240
34.	Heparin sodium vial	5000	IU	2.4	4200
35.	Hyaluronidase amp	1500	IU	0.1	1345
36.	Insulin lente vial	40	IU	2.4	1336
	plain vial	40	IU	0.6	1000
37.	Isoprenaline sulphate amp	2	mg	0.1	75
38.	Hydrocortisone acetate vial	25	mg	0.12	808
		100	mg	0.12	993
39.	Kanamycin vial	1	gm	0.1	11
40.	Ketamine HCl. amp	50	mg	0.2	5900
41.	Lignocaine HCl. 2% vial	30	ml	0.6	306
	2% with adrenaline vial	30	ml	0.1	321
	5% amp	2	ml	0.1	321
42.	Mephentermine sulphate amp	15	ml	1.2	166
		30	ml	0.1	1259
43.	Metoclopramide HCl. amp	5	mg	2.4	123
44.	Methylergometrine maleate amp	0.2	mg	6	72
45.	Methotrexate vial	25	mg	0.3	2949
46.	Metronidazole Bottle	100	ml	4.8	650
47.	Mitomycin-C amp	2	mg	0.48	3811
48.	Morphine sulphate amp	15	mg	3.6	65
49.	Nalorphine hydrobromide amp	1	mg	0.3	954
50.	Nandrolone phenyl propionate amp	25	mg	1,2	175
		75	mg	100	200
51.	Neostigmine amp	0.5	mg	12	86
52.	Nikethamide amp	2	ml	0.1	416
53.	Nor-adrenaline amp	2	ml	0.3	210
54.	Oxytocin amp	5	IU	4.8	93
55.	Paracetamol amp	300	mg	12	99

1	2	3		4	5
56.	Paraldehyde amp	2	ml	0.1	56
57.	Pancuronium bromide amp	1	ml	1.5	1228
58.	Pethidine HCl. amp	50	mg	18	81
59.	Pentazocine amp	30	mg	3.6	240
60.	Phenobarbitone sodium amp	200	mg	6	94
61.	Phenytoin sodium amp	100	mg	2.4	70
62.	Potassium chloride amp 15%	2	ml	12	98
63.	Promethazine HCl. amp 2.5%	2	ml	9	75
64.	Procaine benzyl penicillin forte vial	4	lacs	48	153
		20	lacs	30	383
		40	lacs	18	717
65.	Protamine sulphate amp 1%	5	ml	0.3	320
66.	Propranolol HCl. amp	1	mg	0.24	114
67.	Pyridine aldoxime methiodide (PAM) amp	20	ml	3.6	4300
68.	Reserpine amp	1	mg	0.36	155
69.	Sodium bicarbonate amp 7,5%	10	ml	12	80
70.	Sodium chloride 0.9% Bottle	540	ml	12	770
71.	Streptomycin vial	0.75	gm	36	220
72.	Succinylcholine chloride vial	50	mg	1.2	680
73.	Testosterone propionate amp	25	mg	0.1	865
74.	Tetanus toxoid vial (10 doses)	10	ml	2,4	300
75.	Thiopentone sodium vial	500	mg	4.8	500
		1	mg	2.4	997
76.	Tolazoline HCl amp	25	mg	0.1	48
77.	Trifluprómazine HCl. vial	5	ml	0.1	2000
78.	Triple vaccine amp	1	ml	12	900
		5	ml	1.2	5000
79.	Tubocurarine chloride amp	5	ml	1.2	5444
80.	Verapamil amp	2	ml	0.1	850
81.	Vincristine sulphate vial	1	mg	1.2	2800
82.	Vitamin B1 vial(100 mg/ml)	10	ml	0.1	586
83.	Vitamin B2 vial	10	mg	2.4	16
84.	Vitamin B6 vial	50	mg	2.4	16
85.	Vitamin B12 vial(500 mcg/ml)	10	ml	0.5	20
86.	Vitamin C amp	500	mg	3	156
87.	Vitamin K2 amp	10	mg	3.6	28

1	2	3		4	5
88.	Vitamin B1 +	100	mg		
	Vitamin B6 + amp	50	mg	6	200
	Vitamin B12	1000	mcg		
89.	Vitamin B Complex vial	10	ml	2.4	210
90.	Water for injection amp	5	ml	100	35
		500	ml	0.6	620
91.	Myodil amp	3	ml	1.98	9900
92.	Dynosil vial	20	ml	0.2	2243
93.	Ketamine amp	10	mg	0.2	4335
OINTMENTS, DROPS & APPLICAPS					
1.	Atropine sulphate 1% eye ointment tubes	5	gm	0.6	210
2.	Chloramphenicol applicaps	250	mg	60	7
3.	Chloramphenicol eye drops	5	ml	2	175
4.	Clotrimazole 1% cream	5	gm	1	465
5.	Gentamycin 0.3% eye/ear drops	3	ml	0.1	400
6.	Framycetin sulphate 0.5% eye ointment tube	3	gm	1.2	350
7.	Framycetin sulphate 1% skin ointment tube	15	gm	0.3	583
8.	Hydrocortisone acetate 2.5% skin ointment tube	5	gm	0.24	300
9.	Heparinised skin cream 50 IU/gm tube	15	gm	1.8	527
10.	Lignocaine HCl 5% oint. tube	35	gm	0.6	260
11.	Lignocaine HCl. 5% oint. tube	30	ml	1.5	280
12.	Lignocaine HCl. 2% viscous bottle	100	ml	0.15	542
13.	Lignocaine HCl. 4% topical bottle	30	ml	0.9	370
14.	Nitrofurazone 0.2% oint. tube	28	gm	2.4	350
15.	Nitrofurazone 0.2% oint. jar	500	gm	0.3	4000
16.	Silver sulphadiazine 1% tube	250	gm	1	1330
17.	Oxytetracycline HCl. 10 mg/gm eye oint. tube	3.5	gm	3	114

1	2	3		4	5
	SYRUP, SUSPENSIONS & DROPS				
1.	Ampicillin granules (32.5 gm) 250 mg/5 ml bottle	50	ml	4.8	740
2.	Chloramphenicol Palmitate suspension 125mg/ 5ml bottle	50	ml	1	727
3.	Chlorpromazine HCl. 25mg/ 5ml bottle	500	ml	0.01	3350
4.	Diethylcarbamazine citrate 50mg/5ml bottle	60	ml	0.05	6
5.	Erythromycin succinate 100 mg/5ml bottle	450	ml	1.2	670
6.	Ferrous gluconate 400 mg/ 15 ml bottle	200	ml	2.4	743
7.	Paracetamol 150 mg/5ml bottle	450	ml	0.5	3010
8.	Paracetamol 0.15 gm/ml drops - bottle	450	ml	0.9	3985
9.	Linctus codeine each 5ml Codeine phosphate 22.5mg Citric acid 180 mg Syrup tolu 2 ml bottle	300	ml	3	2885
10.	Piperazine citrate 500 mg/5 ml bottle	500	ml	2.4	1988
11.	Potassium chloride 1.5 gm/5 ml bottle	200	ml	0.01	2000
12.	Promethazine HCl. 5mg/ 5 ml bottle	500	ml	9	1700
13.	Co-trimoxazole suspension 5 ml contains 40:200 bottle	50	ml	0.9	360
14.	Vitamin C 100mg/ml bottle	30	ml	0.1	500
15.	Phenoxymethyl penicillin granules 125mg/ml bottle (32.5 gm)	50	ml	0.6	330
16.	Vitamin B Complex syrup each 5 ml containing Vit. B1 - 5 mg, B6 -2 mg, Nicotinamide 20 mg, D-Panthenol - 3 mg Cyanocobalamin - 10 mcg, Riboflavine - 2.74 mg bottle	450	ml	0.75	900

1	2	3	4	5
17.	Syrup codeine phosphate 35mg/7.5 ml bottle	500 ml	0.6	3010
18.	Syrup tolu 1 in 80 bottle	500 ml	0.6	50
19.	Multivitamin drops each ml contains Vitamin A 8300 IU Vitamin D2 6671 IU Vitamin B1 3.3 mg Riboflavin Phosphate 1.7 mg Nicotinamide 7 mg Vitamin B6 2.5 mg Vitamin C 84 mg bottle	15 ml	0.9	363

Appendix-IV

LIST OF FORMULATIONS PREPARED AT TEACHING HOSPITAL PHARMACY

DROPS FOR OPHTHALMIC USE

Atropine 1%
Eserine 0.25%
Fluorescine 2%, 4%, 10%
Homatropine 2%
Pilocarpine 2%
Streptopenicillin
Sulphacetamide sodium 20%
Zinc boric

EAR DROPS

Acid salicylic spirit 2%
Boric alcohol
Ichthammol 10%

MIXTURES

Alba
Alkaline belladonna
Alkaline diuretica
Asthmatica
Carminative
Cough expectorant
Cough sedative
Kaolin
Linctus codeine
Pectokab
Potassium chloride
Potassium iodide
Sodium salicylate
Syrup sulphasomidine

OTHERS

Acid salicylic ointment 3.3%
Bismuth iodoform paste
Calamine lotion
Dusting powder
Emulsion benzylbenzoate 25%
Ephedrine nasal drops 1%, 0.5%
Eusol
Glycerin acriflavine 1:1000
Glycerine borax
Glycerine glucose nasal
Glycerine iodide
Glycerine ichthamol
Glycerin magnesium sulphate
Glycerine sod.bicarbonate ear solution
Glycerine tannic acid
Hypertonic saline
Ichthammol ointment
Injection of phenol
Liniment of turpentine
Lotion cetrimide 1%, 2%, 5%
Lugol's iodine
Mandel's throat paint
Mercurochrome solution 2%
Normal saline
Oral glycerine 25%, 30%
Paint of podophylline
Silver nitrate 1%, 2% 5%
Sulphur calamine lotion
Sulphur ointment
Tincture iodine
Whitfield ointment
Zinc oxide ointment

Appendix - V

THE OUTPATIENT ATTENDANCE, DISEASE GROUP WISE AND CAUSES OF DEATH IN

RURAL AND URBAN HEALTH CENTRES

PERCENTAGE MORBIDITY

	Rural Health Centre	Urban Health Centre
Anaemia . .	4.3	3.4
Dental . .	1.0	6.1
Diarrhoea including dysentry. .	10.4	4.7
Eye & ENT . .	5.2	4.7
GIT & Liver . .	4.3	3.4
Genito-urinary disorders . .	1.0	0.4
Helminthiasis . .	4.2	4.3
Injury . .	7.3	12.0
Myalgia . .	6.5	1.0
PUO (Fever) . .	2.5	5.1
Respiratory disease . .	30.5	30.8
Skin diseases (including scabies) . .	13.3	11.3
Tuberculosis . .	0.5	0.1
Miscellaneous	1.0	3.0

PERCENTAGE MORTALITY

	Rural Health Centre	Urban Health Centre
Asphyxia neonatorum . .	2.5	--
Cancer . .	2.5	5.6
Cirrhosis liver . .	--	3.8
Diabetes . .	0.8	7.4
Diarrhoea including dysentry . .	12.5	5.6
Encephalitis . .	--	--
Heart disease . .	3.3	38.9
Jaundice / Hepatitis . .	2.5	--
Renal failure . .	--	2.0
Respiratory diseases . .	10.0	13.0
Septicemia . .	0.8	3.8
Suicide (including poisoning) . .	8.3	13.0
Tuberculosis . .	2.5	2.0
Other ill defined causes . .	56.6	1.9

Appendix VI

LIST OF DRUGS RECOMMENDED FOR USE IN RURAL AREAS GOVT.OF INDIA - MAY 1983

Sl No	Name of Drug	Whether basic drug is indigenous(I)or partly indigenous(P.I) or wholly imported (IMP)	Whether to be stocked in PHC/Upgraded PHC(UPHC) Rural Hospital (RH)/Sub Centre(SC)
1	2	3	4
	ANTI-INFECTIVES		
1.	Fortified benzyl penicillin Inj(Procaine benzyl penicillin 3 lacs U., Benzyl penicillin 1 lac U.)	(I)	RH, PHC & SC
2.	Streptomycin sulphate & Penicillin (Streptomycin sulphate 0.5 gm & Procaine Penicillin 3 lacs U.)	(P.I)	PHC & SC
3.	Chloramphenicol capsules (250 mg/125 mg)	(P.I)	PHC
4.	Chloramphenicol suspension (125 mg/ml)	(P.I)	PHC
5.	Tetracycline capsules(250 mg)	(I)	PHC
6.	Sulphadimidine tab(0.5 g)	(I)	PHC
7.	Sulphaphenazole tab(500 mg)	(P.I)	PHC & SC
	ANTI TUBERCULAR DRUGS (Through National Tuberculosis Control Programme)		
8.	Thiacetazone & Isoniazid tab(thiacetazone 37.5 mg & Isoniazid 75 mg)	(I)	PHC

1	2	3	4
9.	Sodium aminosalicylate tab (500 mg)	(I)	PHC
10.	Streptomycin inj (1 gm)	(P.I)	PHC
	ANTI LEPROSY DRUG (Through National Leprosy Control Programme)		
11.	Dapsone tab (100 mg)	(IMP)	PHC
	ANALGESICS, HYPNOTICS & SEDATIVES		
12.	Acetyl salicylic acid tab (o.3 gm)	(I)	PHC & SC
13.	Paracetamol syrup (125 mg in 5 ml)	(I)	PHC
14.	Phenobarbitone tab (30, 60, 100 mg)	(I)	PHC & SC
	ANTI ANOEBIC & GASTRO ENTEROLOGIC DRUGS		
15.	Kaolin light powder	(I)	PHC
16.	Iodochlor-hydroxyquinoline tab (0.25 gm)	(P.I)	PHC
17.	Chloroquine sulphate tab (0.2 gm) or Chloroquine phosphate (0.25 gm)	(P.I)	PHC
18.	Piperazine citrate elixir (750 mg in 5 ml)	(I)	PHC
19.	Bephenium hydroxynaphthoate granules (2.5 gm base in 5 gm granules)	(P.I)	PHC
20.	Sulphaguanidine tab (500 mg)	(I)	PHC
21.	Metronidazole tab (200 mg)	(I)	PHC

1	2	3	4
	DRUGS FOR THE EYE AND NATIONAL TRACHOMA CONTROL PROGRAMME		
22.	Tetracycline ointment 1% in sterile ointment base	(P.I)	PHC
23.	Sulphacetamide drops (10% & 20%)	(I)	PHC
	DRUGS USED IN ANAEMIA (Through Family Planning)		
24.	Ferrous sulphate & Folic acid tab (Dept.of Family Planning formula) (200 mg of exsiccated Ferrous sulphate containing 60 mg of elemental iron + 5 mg of folic acid)	(I)	PHC
25.	Iron inj (100 mg - Iron carbo-hydrate complex 2 ml)	(I)	PHC
26.	Liver inj (each ml has a Vit. B 12 activity equivalent to either 1 mcg or 2 mcg of cyano-cobalamin	(I)	PHC
	ANTI-MALARIAL DRUGS (Through National Malaria Eradication programme.		
27.	Primaquine diphosphate tab (7.5 mg of primaquine base)	(IMP)	PHC
28.	Pyrimethamine sulphate equivalent to 25 mg of pyrimethamine	(I)	PHC
	ANTI FILARIAL DRUGS (Through National Filaria Control programme.		
29.	Diethylcarbamazine citrate tab (50 mg)	(I)	PHC

1	2	3	4
	ANTACID		
30.	Magnesium trisilicate compound (Mag.trisilicate 0.3 gm, Aluminium hydroxide 0.3 gm)	(I)	PHC
31.	Gripe mixture for infants (5 ml contains Dill oil 0.005ml, Sodium bicarbonate 0.05 gm, Dehydrated alcohol 0.0248 ml)	(I)	PHC
	ANTITUSSIVE & EXPECTORANTS		
32.	Diphenhydramine expectorant syrup (each 5 ml contains Diphenydramine hcl 13.3 mg, Menthol 0.9 mg, Sodium citrate 56.6 mg, Choloroform in flavoured syrup 0.22 ml)	(I)	PHC
	ANTIASTHMATIC DRUGS		
33.	Ephedrine restinate 123 mg + Ephedrine hcl 50 mg + Theophylline 65 mg + Phenobarbitone 30 mg tab	(P.I)	PHC
34.	Aminophylline inj (0.5gm/2 ml)	(P.I)	PHC
	POST PARTUM TREATMENT		
35.	Ergometrine tab (0.5 mg of Ergometrine maleate)	(P.I)	PHC & SC
36.	Methylergometrine inj 0.2 mg/ml	(IMP)	PHC
37.	Oxytocin inj (5 I.U./ml)	(IMP)	PHC

1	2	3	4
	CARDIAC DRUGS		
38.	Digoxin tab (0.25 mg)	(P.I)	PHC
39.	Isosorbide dinitrate tab (20 mg)	(IMP)	PHC
	ANTI HYPERTENSIVE DRUGS		
40.	Reserpine+ Hydrochlorthiazide (Reserpine 0.1 mg, Hydrochlor-thiazide 10 mg)	(P.I)	PHC & SC
41.	Furosemide inj (20 mg/2ml)	(IMP)	PHC
	ANTI EMETICS		
42.	Chloropromazine inj (1% & 25%)	(P.I)	PHC
43.	Chloropromazine tab (10mg,25mg & 50 mg)	(P.I)	PHC & SC
	DRUGS ACTING ON THE SKIN		
44.	Benzyl benzoate emulsion (100 ml contains Benzyl benzoate 25 g, Emulsifying wax 2 gm, Demineralised water)	(I)	PHC & SC
45.	Whitfield ointment (Benzoic acid 6 gm, Salicylic acid 3 gm, Alcohol 70% upto 100 gm)	(I)	PHC
46.	Nitrofurazone ointment (0.2% in non-greasy ointment base)	(I)	PHC
47.	Potassium permanganate - 5 gm packets	(I)	PHC & SC
	ANTI SEPTICS, DETERGENTS & DRESSING		
48.	Chloroxylenol solution	(I)	PHC & SC
49.	Iodine solution(iodine 1 gm, Pot.iodine 1.5gm, Dist.water)	(P.I)	PHC

1	2	3	4
50.	Calcium gluconate inj(10%)	(I)	PHC & SC
51.	Plaster of paris bandages	(I)	PHC
52.	Adhesive plaster	(I)	PHC
	GENERAL ANAESTHETICS		
53.	Ethyl chloride (100 ml spray)	(I)	PHC
	DRUGS ACTING ON EAR		
54.	Boric acid-Alcohol drops (Boric acid 1.5%, Glycerol 3.3% in 95% Alcohol 10 ml)	(I)	PHC & SC
	VITAMINS		
55.	Vitamin A 6000 U cap & Calciferol 1000 U cap	(I)	PHC
56.	Vitamin B1, B6, B12 inj	(P.I)	PHC & UPHC
57.	Vitamin C tab (100 mg)	(P.I)	PHC
58.	Vitamin C inj (0.1 gm/2 ml & 0.5 gm/5 ml)	(P.I)	PHC
	EMERGENCY DRUGS		
59.	Nikethamide inj	(I)	PHC
60.	Antivenom serum (polyvalent)	(I)	PHC
61.	Rehydration fluid	(P.I)	PHC
62.	Prednisolone acetate inj (20mg/ml)	(P.I)	PHC
63.	Glucose amp(25%)	(I)	PHC & SC
64.	Distilled water amp (25 ml)	(I)	PHC
65.	Phenobarbitone sodium inj	(I)	PHC
66.	Tetanus anti-toxin (1500, 10,000, 20,000, 50,000 IU)	(I)	UPHC
67.	Adrenaline hcl inj (1 mg/ml)	(I)	PHC
68.	Bleaching powder	(I)	PHC
69.	Phenyle	(I)	PHC
70.	Potassium citrate	(P.I)	PHC

1	2	3	4
71.	Sodium bicarbonate	(I)	PHC
72.	Tincture Belladona	(I)	PHC
73.	Tincture Card Co	(I)	PHC
74.	Sodium salicylate	(I)	PHC
75.	Acid boric	(I)	PHC
76.	Glycerine	(I)	PHC
77.	Paraffin molls flavum	(I)	PHC
78.	Liquid paraffin	(P.I)	PHC
79.	Magnesium sulphate powder	(I)	PHC
80.	Phenylbutazone tab (100 mg)	(I)	PHC
81.	Hydroxy ethyl theophylline inj (220 mg/ml)	(IMP)	RH & PHC
	ANTI DIABETIC DRUG		
82.	Insulin inj plain(40 U/ml)	(P.I)	PHC
	HOUSEHOLD REMEDIES		
83.	Milk of magnesia tab (100 mg)	(I)	PHC
84.	Sodium bicarbonate 54.8%+ Tartaric acid 35.1%	(P.I)	PHC
85.	Sodium sulphate exsic.20 mg + Sodium chloride 10 mg + Potassium chloride 10 mg + Potassium sulphate 55 mg + Citric acid 45 mg + Magnesium sulphate exsic.720 mg	(P.I)	PHC
86.	Phenyl dimethyl-isopropyl pyrazolone 0.155 gm + Acet-p-phenetidin 0.25 gm + Di-ethyldioxp-tetra-hydropropy-ridine 50 mg + Trimethyldioxopurine 50 mg	(I)	PHC

1	2	3	4
87.	Aspirin tab (300 mg)	(I)	PHC
88.	Resublimed Iodine 4% + Methyl salicylate 5% ointment	(P.I)	PHC
89.	Oil eucalyptus 8% + Oil clove 1% + Camphor 5% + Menthol 3% + Thymol 2% Methyl Salicylate 5%	(P.I)	PHC
90.	Tonic for children(each 15 ml contains Vit.A 12,500 I.U., Vit.D2 2500 I.U. Saccharated iron oxide 1.77 gm, Calcium gluconate 0.2 gm, Vit.B1 1.5 mg, Vit.B2 1mg, Niacinamide 20 mg, Malt ext.	(I)	PHC
91.	Cough syrup:(each 5 ml contains Antimony tartrate 0.56 mg, Terpene hydrate 11.12 mg, Codein phosphate 11.12 mg, Menthol 3.7 mg, Tolu syrup 1.25 ml, Syrup Vaśaka 0.47 ml	(P.I)	PHC & RH
92.	Menthol 1.36 mg + Oleoresin cubex 0.12 mg + Olepansi 5 mg + Ext.glycrhiza 80 mg + Oil mentha 5 mg + Balsum tolu 12 mg + Oleo-eucalyptus 3.6 mg+ Capsiti 8 mg + Ext.tussilagin liquid 2.08 mg+ Sugar-cum-base tab	(P.I)	PHC

LIST OF OPTIONAL DRUGS TO BE SUPPLIED TO SUB CENTRE

For internal use:

1. Bephenium hydroxy naphthoate granules
2. Calcium glucoate tab
3. Cough mixture
4. Dried aluminium hydroxide tab
5. Kaolin pectin suspension
6. Magnesium hydroxide tab
7. Magnesium sulphate
8. Mixt alkaline
9. Mixt carminative
10. Mixt chloral hydrate
11. Mixt sedative expectorant
12. Multivitamin tab (A, B, C, D)
13. Phthalyl sulphathiazole tab
14. Piperazine citrate/piperazine adipate tab
15. Vitamin C tab

For external use:

16. Benzoic salicylic ointment
17. Boric acid powder
18. Calamine lotion
19. Chloromycetin eye ointment (applicaps)
20. Menthol & Eucalyptus oil ointment
21. Mercurochrome 2%
22. Methyl salicylate ointment
23. Methylated spirit
24. Tincture benzoin
25. Tincture Iodine
26. White vaseline

Appendix VII

LIST OF ESSENTIAL DRUGS TO BE SUPPLIED TO SUB CENTRE

For internal use:

1. Acetyl salicylic acid tab
2. Belladona & Phenobarbitone tab
3. Chloroquine phosphate tab
4. Ergometrine maleate tab
5. Iron & Folic acid tab
6. Liquid paraffin
7. Mebendazole tab
8. Mepyramine tab
9. Oral rehydration powder
10. Paracetamol tab
11. Prochloroperazine tab
12. Sulphadimidine tab
13. Syrup ferric citrate
14. Vitamin A solution
15. Methyl ergometrine maleate Inj

For external use:

16. Acriflavine ointment
17. Antiseptic lotion (Savlon/Dettol)
18. Benzyl benzoate emulsion
19. Boroglycerine
20. Gentian violet 2%
21. Sulphacetamide eye & ear drops 10%
22. Tetracycline eye ointment
23. Zinc boric dusting powder
24. Absorbent cotton wool
25. Absorbent gauze
26. Roller bandage
27. Chemistrips (for Albumin & Sugar)

Appendix-VIII

DRUGS PRESENTLY AVAILABLE FOR OUTPATIENTS AT THE URBAN/RURAL HEALTH CENTRES OF A TEACHING HOSPITAL, 1988

FOR THE GENERAL OUT-PATIENTS:

Tablets, Capsules & External Use

Aminophylline	100	mg
Aspirin	325	mg
Calcium gluconate	100	mg
Chloramphenicol	250	mg
Chloramphenicol-ophthalmic		
Chloramphenicol+ Streptomycin	125	mg
Chloroquine	250	mg
Chlorpheniramine	4	mg
Chlorpromazine	50	mg
Clofazimine	100	mg
Dapsone	100	mg
Diazepam	5	mg
Digoxin	0.25	mg
Diphenylhydantoin	100	mg
Diethylcarbamazine	100	mg
Ethambutol	400	mg
	800	mg
Ferrous sulphate	200	mg
Frusemide	40	mg
Furazolidone	100	mg
Glibenclamide	5	mg
Glyceryl trinitrate	3	mg
Haloperidol	0.25	mg
Hydralazine + Reserpine	10 / 0.1	mg
Hydrochlorthiazide	50	mg
Iron+Folic acid	0.5	mg
Isoniazid	100	mg
	300	mg
Isoniazid + Thiacetazone	300 / 150	mg
Liv.52		
Magnesiumtrisilicate	500	mg
Metronidazole	200	mg
Methylergonovine	0.125	mg
Nitrazepam	5	mg
Norethisterone	5	mg
Oxyphenbutazone	100	mg
Penicillin-V	125	mg
Phenobarbitone	60	mg
Phthalylsulphathiazole	500	mg
Promethazine	25	mg
Prednisolone	5	mg
Propranolol	40	mg
Quinidochlor	250	mg
Rifampicin	150	mg
	300	mg
	450	mg
Salbutamol	4	mg
Sulphaphenazole	500	mg
Tetracycline	250	mg
Thiacetazone	150	mg
Trihexyphenidyl	2	mg
Trimipramine	25	mg
Vit.A +	6000	IU
Vit.D	400	IU
Vit. B. Complex	4	mg
Vit. C	100	mg
Vit. K+	20	mg
Vit. C+	100	mg
Rutin	100	mg

INJECTIONS

- Adrenaline
- Aminophylline
- Analgin
- Atropine
- Baralgan
- Betamethasone
- Benzathine penicillin
- Benzylpenicillin
- Buprenorphine
- Calcium gluconate
- Chlorpheniramine
- Chlorpromazine
- Dexamethasone
- Dextrose 5%, 10% and 25%
- Diazepam
- Distilled water
- Digoxin
- Etophylline + Theophylline
- Frusemide
- Hydrocortisone succinate
- Hyosine butylbromide
- Insulin plain
- Iron-Dextran
- Lente insulin
- Lignocaine 2%
- Metoclopramide
- Methylergonovine
- Morphine
- Normal saline
- Oxytocin
- Paracetamol
- Phenobarbitone
- Pethidine
- Pentazocine
- Promethazine
- Procaine penicillin
- Ringer lactate solution
- Sodium bicarbonate
- Sodium thiopentone
- Streptomycin
- Streptopenicillin
- Vit. B1 + B6 + B12
- Vit. B. Complex

LIQUIDS AND MISCELLANEOUS PREPARATIONS

Benzyl benzoate emulsion
Bephenium hydroxynaphthoate granules
Bismuth kaolin mixture
Boric acid drops
Cough expectorant mixture
Cough sedative mixture
Dextrose powder
Furazolidone syrup
Hydrogen peroxide
Kaolin + pectin + neomycin
Liniment of turpentine
Liquid paraffin
Multivitamin drops
Neomycin + bacitracin ointment
Nitrofurazone ointment/cream
Oral rehydration mixture
Paracetamol drops/syrup
Pectin + kaolin mixture
Piperazine syrup
Potassium permanganate crystals
Promethazine syrup
Salicylic acid + benzoic acid ointment
Sodium bicarbonate drops
Streptopenicillin eye drops
Sulphadimidine syrup
Sulphur ointment
Tincture benzoin
Vit. B. Complex syrup
Zinc cream

Appendix IX

ESSENTIAL DRUGS LIST FOR A TEACHING HOSPITAL, 1989

Drugs	Route of administration, dosage forms, and strength
1. ANAESTHETICS	
1.1 General anaesthetics and oxygen	
ether, anaesthetic	inhalation
halothane	inhalation
ketamine	injection, 50 mg/ml in 10 ml vial
nitrous oxide	inhalation
oxygen	inhalation (medicinal gas)
thiopental	powder for injection, 0.5 g, 1.0 g (sodium salt) in ampoule
1.2 Local anaesthetics	
bupivacaine	injection, 0.5%, 1.0% (hydrochloride) in 10 ml and 2 ml vials
lidocaine	injection, 2%, 5% (hydrochloride) in vial with or without epinephrine 1:100 000 topical form 2-4% and viscous
2. ANALGESICS, ANTIPYRETICS, NON-STEROIDAL ANTI-INFLAMMATORY DRUGS AND DRUGS USED TO TREAT GOUT	
2.1 Non-opioids	
acetylsalicylic acid	tablet, 300 mg
ibuprofen	tablet, 200 mg
paracetamol	tablet, 500 mg
	injection, 300 mg in 2 ml
	syrup, 125 mg/5 ml
indomethacin	tablet, 100 mg

COMMUNITY HEALTH CELL
47/1, (First Floor) St. Marks Road
BANGALORE - 560 001

Drugs	Route of administration, dosage forms, and strengths
2.2 Opioid analgesics	
codeine	(phosphate) syr, 25 mg/5 ml
morphine	inj, 15 mg (sulfate or hydrochloride) in 1 ml amp
pethidine	inj, 50 mg (hydrochloride) in 1 ml
pentazocine	inj, 30 mg/ml
3. ANTIALLERGICS	
chlorpheniramine	tab, 4 mg (maleate)
	inj, 10 mg / 10 ml vial
dexamethasone	inj, 4 mg (sodium phosphate) in 1 ml
epinephrine	inj, 1 mg (as hydrochloride) in 1 ml amp
prednisolone	tab, 5 mg
4. ANTIDOTES AND OTHER SUBSTANCES USED IN POISONINGS	
4.1 General	
charcoal, activated	powder
magnesium sulfate	powder
4.2 Specific	
atropine	inj, 0.65 mg/1 ml (sulfate)
dimercaprol	inj, in oil 50 mg/ml in 2 ml amp
naloxone	inj, 0.4 mg (hydrochloride) in 1 ml amp
disodium calcium edetate	inj, 200 mg/ml in 10 ml amp
sodium nitrite	inj, 30 mg/ml in 10 ml amp
sodium thiosulfate	inj, 250 mg/ml in 50 ml amp
penicillamine	cap or tab, 250 mg/500 mg
pralidoxime (pyridine-2-aldoxime methyl chloride, PAM)	inj, 25 mg/ml in 20 ml amp
5. ANTIEPILEPTICS	
diazepam	inj, 5 mg/ml in 2 ml amp
	tab, 5 mg

Drugs	Route of administration, dosage forms and strength
ethosuximide	cap or tab, 250 mg
phenobarbital	tab, 30 mg/60 mg
	inj, 300 mg/ml
phenytoin	tab, 100 mg (sodium salt)
	inj, 100 mg (sodium salt) in 2 ml amp
carbamazepine	tab, 200 mg
valproic acid	tab, 200 mg (sodium salt)
6. ANTIINFECTIVE DRUGS	
6.1 Anthelminthic drugs	
mebendazole	tab, 100 mg
piperazine	elixir or syr (as citrate) equivalent to 500 mg hydrate/5 ml
pyrantel	tab, 250/500 mg (pamoate) sup 50 mg/ml
6.2 Antiamoebic drugs	
chloroquine	tab, 250 mg (as phosphate or sulfate)
	inj, 40 mg/ml in 5 ml amp
diloxanide	tab, 500 mg (furoate)
metronidazole	tab, 200 mg/400 mg
	inj, 5 mg/ml 100 ml
dehydroemetine	inj, 60 mg (hydrochloride) in 1 ml amp
6.3 Antibacterial drugs	
6.3.1 Penicillins	
ampicillin	cap, 250 mg/500 mg (anhydrous) powder for oral sup, 125 mg (anhydrous) 5 ml powder for inj, 500 mg (as sodium salt) in vial
benzathine benzylpenicillin	inj, 1.44 g benzylpenicillin (2.4 million IU)/5 ml in vial
benzylpenicillin	powder for inj, 0.6 g (= 1 million IU) 3.0 g (5 million IU) 1.5 g (2.5 million IU) as sodium or potassium salt) in vial

Drugs	Route of administration, dosage forms, and strength
cloxacillin	cap, 500 mg (as sodium salt) powder for inj, 500 mg (as sodium salt) in vial
procaine benzylpenicillin	powder for inj, 1 g (=1 million IU) 3 g (=3 million IU)
phenoxymethyl-penicillin	tab, 250 mg (as potassium salt)
carbenicillin	inj, 250 g in vial
6.3.2 Other antibacterial drugs	
chloramphenicol	cap, 250 mg, powder for inj, 1 g (as sodium succinate) in vial
erythromycin	tab, 250 mg (as stearate or ethyl succinate) oral sup, 500 mg (as lactobionate) in vial
gentamicin	inj, 80 mg (as sulfate)/ml in 2 ml vial
sulfamethoxazole + trimethoprim	tab, 800 mg + 160 mg/400 mg + 80 mg inj, 200 mg + 40 mg/5 ml
tetracycline	cap, 250 mg (hydrochloride)
nitrofurantoin	tab, 100 mg
6.3.3 Antileprosy drugs	
clofazimine	cap, 50 mg/100 mg
dapsone	tab, 100 mg/50 mg
rifampicin	cap, 150 mg/300 mg/450 mg
6.3.4 Antituberculosis drugs	
ethambutol	tab, 200 mg, 400 mg, 800 mg (hydrochloride)
isoniazid	tab, 100 mg, 300 mg
pyrazinamide	tab, 500 mg
rifampicin	cap, 150 mg/300 mg/450 mg
streptomycin	powder for inj, 0.75 mg (as sulfate) in vial
thioacetazone + isoniazid	tab, 50 mg + 100 mg/150 mg + 300 mg
6.4 Antifilarial drugs	
diethylcarbamazine	tab, 50/100 mg citrate

Drugs	Route of administration, dosage forms, and strength
6.5 Antifungal drugs	
griseofulvin	tab, 125/250 mg
Nystatin	tab, 5 lakh IU
6.6 Antileishmaniasis drugs	
6.7 Antimalarial drugs	
chloroquine	tab, 150 mg (as phosphate or sulphate) syr, 50 mg (as phosphate or sulfate)/ 5 ml
pyrimethamine + sulfadoxine	tab, 25 mg and 500 mg respectively
7. ANTIMIGRAINE DRUGS	
8. ANTINEOPLASTIC AND IMMUNOSUPPRESSIVE DRUGS	
8.1 Cytotoxic drugs	
cis-platin	inj, 10 mg 1 vial
chlorambucil	tab, 2 mg
cyclophosphamide	tab, 25 mg powder for inj, 500 mg in vial
methotrexate	inj, 50 mg (as sodium salt) in vial
vincristine	powder for inj, 1 mg/5 mg (sulfate) in vial
5-Fluorouracil	inj, 250 mg 1 amp
8.2 Hormones and antihormones	
dexamethasone	inj, 4 mg (sodium phosphate) in 1 ml amp
prednisolone	tab, 5 mg
9. ANTIPARKINSONISM DRUGS	
trihexyphenidyl HCL	tab, 2 mg
levodopa + carbidopa	tab, 100 mg + 10 mg
10. BLOOD, DRUGS AFFECTING THE	

Drugs	Route of administration, dosage forms and strength
10.1 Antianaemia drugs	
ferrous sulfate	tab, equivalent to 60 mg iron oral solution, equivalent to 15 mg iron (as sulfate) in 0.6 ml
folic acid	tab, 1 mg inj, 1 mg (as sodium salt) in 1 ml amp
hydroxycobalamin	inj, 1 mg in 1 ml amp
iron dextran	inj, equivalent to 50 mg iron/ml in 2 ml amp
10.2 Anticoagulants and antagonists	
heparin	inj, 5000 IU/ml, in vial
protamine sulfate	inj, 10 mg/ml in 5 ml amp
phenindione	tab, 50 mg
11. BLOOD PRODUCTS AND BLOOD SUBSTITUTES	
11.1 Plasma substitute	
dextran 40	injectable solution 6% in dextrose/saline
polymer from degraded gelatin (equivalent to nitrogen content of 0.63 g) 3.5 g electrolyte (Na 145, K 51, Ca 12.5 and Cl 145 mEq/100 ml)	500 ml
12. CARDIOVASCULAR DRUGS	
12.1 Antianginal drugs	
isosorbide dinitrate	tab, (sublingual) 5 mg
propranolol	tab, 10 mg/40 mg (hydrochloride)
glyceryl trinitrate	(sublingual) tab, 0.5 mg

Drugs	Route of administration, dosage forms and strength
verapamil	tab, 40 mg/80 mg (hydrochloride) inj, 2.5 mg/ml (hydrochloride) in 2 ml amp
dipyridamole	tab, 100 mg
12.2 Antidysrhythmic drugs	
isoprenaline	inj, 2 mg/ml amp (hydrochloride or sulfate)
propranolol	tab, 10 mg/40 mg (hydrochloride) inj, 1 mg (hydrochloride) in 1 ml amp
quinidine	tab, 200 mg (sulfate)
disopyramide	tab, 100 mg
lidocaine	inj, 20 mg (hydrochloride)/ml in 5 ml amp
12.3 Antihypertensive drugs	
dihydralazine	tab, 50 mg (hydrochloride)
hydrochlorothiazide	tab, 25/50 mg
propranolol	tab, 40 mg (hydrochloride)
atenolol	tab, 50 mg
clonidine	tab, 100 mg
nifedipine	cap, 5 mg/10 mg/20 mg
methyldopa	tab, 250 mg
12.4 Cardiac glycosides	
digoxin	tab, 0.25 mg oral solution 0.05 mg/ml inj, 0.25 mg/ml in 2 ml amp
12.5 Drugs used in shock or anaphylaxis	
dopamine	inj, 40 mg (hydrochloride)/ml in 5 ml vial
13. DERMATOLOGICAL DRUGS	
13.1 Antifungal drugs	
benzoic acid + salicylic acid	ointment or cream, 6% + 3%
tolnaftate	solution 1% in propylene glycol

Drugs	Route of administration, dosage forms, and strengths
clotrimazole	ointment 1%
sodium thiosulphate	lotion
13.2 Antiinfective drugs	
gentian violet	aqueous or alcoholic solution 1%
neomycin + bacitracin	eye ointment, 5 mg neomycin sulfate + 500 IU bacitracin zinc/g
nitrofurazone	0.2% ointment
13.3 Antiinflammatory and antipruritic drugs	
betamethasone	ointment or cream, 0.1% (as valerate)
calamine	lotion
hydrocortisone	ointment or cream 1% (acetate)
13.4 Astringent drugs	
aluminium acetate	solution, 13% for dilution
13.5 Keratoplastic and keratolytic agents	
podophylline	solution, 10-25%
salicylic acid	solution, topical 5%
coal tar	solution
13.6 Scabicides and pediculicides	
benzyl benzoate	lotion 25%
14. DIAGNOSTIC AGENTS	
14.1 Ophthalmic drugs	
fluorescein	eye drops, 1% (sodium salt) inj, 5% in 10 ml amp (sodium salt)
14.2 Radiocontrast media	
meglumine amidotrizoate	inj, 60% in 20 ml amp
sodium amidotrizoate	inj, 50% in 20 ml amp
barium sulfate	susp, 90%
iopanoic acid	tab, 500 mg
iohexol	inj, 300 mg in 10 ml amp

Drugs	Route of administration, dosage forms, and strength
15. DISINFECTANTS	
acriflavine	solution
phenyl	RWQ 4-5
chlorhexidine	solution 5% (digluconate) for dilution
iodine	solution, 2.5%
lysol	
gentian violet	topical solution 1%
chloroxylenol	topical solution, 1%
ethyl alcohol	denatured, rectified and absolute
cetrimide	
16. DIURETICS	
furosemide	tab, 40 mg, inj, 10 mg/ml 2 ml amp
hydrochlorothiazide	tab, 50 mg
mannitol	injectable solution, 20%
spironolactone	tab, 25 mg
17. GASTROINTESTINAL DRUGS	
17.1 Antacids and other antiulcer drugs	
aluminium hydroxide	oral susp, 320 mg + 180 mg/5 ml
+ magnesium hydroxide	tab, 250 mg + 250 mg
cimetidine	tab, 200 mg
17.2 Antiemetic drugs	
promethazine	tab, 25 mg (hydrochloride) elixir or syr, 5 mg (hydrochloride)/5 ml inj, 25 mg (hydrochloride)/ml in 2 ml amp
metoclopramide	tab, 10 mg (as hydrochloride) inj, 5 mg/ml in 2 ml amp
prochlorperazine	tab, 5 mg
17.3 Antispasmodic drugs	
atropine	inj, 0.65/1 mg (sulfate) in 1 ml amp
17.4 Cathartic drugs	
bisacodyl	tab, 5 mg 10 mg

Drugs	Route of administration, dosage forms, and strength
castor oil	oil
liq. paraffin	oil

17.5 Diarrhoea, drugs used in

17.5.1 Antidiarrhoeal (symptomatic) drugs

loperamide	tab, 2 mg
diphenoxylate	tab, 2.5 mg (as hydrochloride)

17.5.2 Replacement solution

rehydration salts	g/litre
sodium chloride	3.5
trisodium citrate dihydrate	2.9
potassium chloride	1.5
glucose	20.0

18. HORMONES

18.1 Adrenal hormone and synthetic substitutes

hydrocortisone	powder for inj, 100 mg (as sodium succinate) in vial
	2.5 mg (as acetate) in vial
prednisolone	tab, 5 mg

18.2 Contraceptives

ethinylestradiol + levonorgestrel	tab, 0.03 mg + 0.15 mg, 0.05 mg + 0.25 mg
ethinylestradiol + norethisterone	tab, 0.05 mg + 1.0 mg
depot medroxyprogesterone acetate	inj, 150 mg in 3 ml vial
norethisterone	tab, 0.35 mg
norethisterone enanthate	inj, 200 mg in vial

Drugs	Route of administration, dosage forms, and strength
18.3 Estrogenes	
diethyl stilbestrol	tab, 1 mg
ethinylestradiol	tab, 0.05 mg
18.4 Insulin and other antidiabetic agents	
insulin injection (soluble) plain	inj, 40 IU/in 10 ml vial
intermediate acting insulin (lente)	inj, 40 IU/ml in 10 ml vial, (as compound insulin zinc suspension or isophane insulin)
glibenclamide	tab, 5 mg
chlorpropamide	tab, 100 mg
18.5 Thyroid hormones and antithyroid drugs	
levothyroxine	tab, 0.05 mg, (sodium salt)
carbimazole	tab, 5 mg
19. IMMUNOLOGICALS	
19.1 Sera and immunoglobulines	
polyvalent antivenom sera	inj, 20-50 ml vial (lyophilised serum)
diphtheria antitoxin	inj, 10 000 IU
tetanus antitoxin (human globulin)	inj, 250, 500 IU in vial
19.2 Vaccines	
For universal immunization	
BCG vaccine (dried)	inj
diphtheria-pertussis-tetanus vaccine	inj
measles vaccine	inj
poliomyelitis vaccine (inactivated)	oral solution
tetanus vaccine	inj, 10 dose vial

Drugs	Route of administration, dosage forms, and strength
For specific groups of individuals	
typhoid vaccine	inj
20. MUSCLE RELAXANTS (PERIPHERALLY ACTING) AND CHOLINESTERASE INHIBITORS	
pancuronium	inj, .01 mg/1 ml amp
gallamine	inj, 40 mg (triethiodide)/ml in 10 ml amp
d-tubocurarine	inj, 10 mg/ml 5 ml amp
neostigmine	tab, 15 mg Bromide, inj, 0.5 mg (methylsulfate) in 1 ml amp
suxamethonium	inj, 50 mg (chloride) ml in 2 ml amp
succinylcholine	inj, 50 mg/ml in 100 ml vial
21, OPHTHALMOLOGICAL PREPARATIONS	
21.1 Antiinfective agents	
silver nitrate	solution (eyedrops), 1%
sulfacetamide	solution (eyedrops), 10% sodium salt
tetracycline	eye ointment, 1% (hydrochloride)
chloramphenicol	eye drops 0.5% applicaps
framycetin	eye ointment, 0.5% eye drops (sulfate)
21.2 Antiinflammatory agents	
hydrocortisone	eye ointment, 1% (acetate)
21.3 Miotics and antiglaucoma drugs	
acetazolamide	tab, 250 mg
pilocarpine	solution (eye drops) 2%, 4% (hydrochloride or nitrate)
timolol	solution (eye drops), 0.25%, 0.5% (maleate)
21.4 Mydriatics	
homatropine	solution (eye drops), 2% (hydrobromide)

Drugs	Route of administration, dosage forms, and strength
phenylephrine	10% (hydrochloride) eye drops
atropine	applicaps
22. OXYTOCICS	
methylergonovine	tab, 0.2 mg (maleate) inj, 0.2 mg (maleate) in 1 ml amp
oxytocin	inj, 10 IU in 1 ml amp
24. PERITONEAL DIALYSIS SOLUTION	
Intraperitoneal dialysis solution (of appropriate composition)	parenteral solution
24. PSYCHOTHERAPEUTIC DRUGS	
amitriptyline	tab, 25 mg (hydrocholoride)
chlorpromazine	tab, 100 mg (hydrocholoride)
	syr, 25 mg (hydrocholoride) 5 ml
	inj, 25 mg (hydrocholoride)/ ml
diazepam	tab, 5 mg
	inj, 5 mg/ml 2 ml amp
haloperidol	tab, 1.5 mg/5 mg
	inj, 5 mg/ml 2 ml amp
imipramine	tab, 25 mg (hydrocholoride)
lithium carbonate	cap or tab, 300 mg/150 mg
trifluoperazine	tab, 5 mg
nitrazepam	tab, 5 mg
25. RESPIRATORY TRACT, DRUGS ACTING ON	
25.1 Antiasthmatic drugs	
aminophylline	tab, 100 mg/200 mg
	inj, 25 mg/ml in 10 ml amp
epinephrine	inj, 1: 1000 in 2 ml amp (tartrate)
salbutamol	tab, 4 mg (sulfate) syrup 2 mg (sulfate)/5 ml inj, 50 mg/ml in 5 ml amp
theophylline	tab, inj

Drugs	Route of administration, dosage forms, and strength
25.2 Antitussives	
codeine	syr, 125 mg/5 ml (phosphate)
26. SOLUTIONS CORRECTING WATER ELECTROLYTE AND BASE DISTURBANCES	
26.1 Oral	
potassium chloride	oral solution
26.2 Parenteral	
ringer lactate	injectable solution 5% isotonic 540 ml
glucose	5%, 10%, 540 ml bottles 25% and 50% 25 ml amp
normal saline	0.9% 540 ml bottles
mannitol	inj, 20% 300 ml.
potassium chloride	injectable solution, 15% 10 ml amp
sodium bicarbonate	8.4% solution in 10 ml amp or 7.5% 10 ml amp
26.3 Miscellaneous	
water for inj	in 2 ml, 5 ml, 10 ml amp, 500 ml bot.
27. VITAMINS AND MINERALS	
ascorbic acid	tab, 100 mg/500 mg inj, 500 mg/5 ml
ergocalciferol	cap or tab, 1.25 mg (50 000 IU) oral solution, 0.25 mg/ml (10 000 IU)
nicotinamide	tab, 500 mg
pyridoxine	tab, 25 mg (hydrochloride) 50 mg, inj, 50 mg in 2 ml
retinol	cap, 7.5 mg/60 mg, oral solution 15 mg/ml (50 000 IU)
riboflavin	tab, 10 mg
thiamine	tab, 100 mg (hydrochloride)
calcium gluconate	inj, 100 mg/ml in 10 ml amp, tab

Drugs	Route of administration, dosage forms, and strength
B complex	tab, Vit B1 2 mg
	tab, Vit B2 2 mg
	tab, Vit B6 0.5 mg
	tab, Niacinamide 25 mg
	cal. pantothenate 1 mg
Vit A and D	cap, 6000 IU + 1000 IU

*When the strength is specified in terms of a selected salt or ester, this is mentioned in brackets; when it refers to the active moiety, the name of the salt or ester in brackets is preceded by the word "as".

JAWAHARLAL INSTITUTE OF POSTGRADUATE MEDICAL EDUCATION AND RESEARCH : PONDICHERRY 605 006 : WORKSHOP ON TRAINING OF INTERNS ON CONCEPT OF ESSENTIAL DRUGS AND RATIONALISED DRUG USE

TEST

Direction: For questions 1 to 13, circle the alphabet against the most appropriate answer out of the five alternatives given.

1. The Primary Health Care includes the following except:

   a) Immunization against infectious diseases
   b) Provision of essential drugs
   c) Supply of drugs at a subsidised price
   d) Treatment of common diseases
   e) Promotion of food supply and proper nutrition

2. The advantages of having an essential drug list do not include:

   a) More cost effective drug control and distribution
   b) Effective evaluation of health needs
   c) Encouraging local drug production
   d) Identification and avoidance of adverse drug reactions
   e) Treatment of all diseases

3. The guidelines for preparing an essential drugs list include the following except:

   a) Morbidity and mortality statistics
   b) Efficacy and safety
   c) Financial resources
   d) Drugs made by reputed pharmaceutical houses
   e) Training of health workers and treatment facilities

4. Drug utilisation studies give information about:

   a) Marketing of drugs
   b) Distribution of drugs
   c) Prescription of drugs
   d) Usage of drugs
   e) All of the above

5. The best way to restrict indiscriminate use of drugs is by:

   a) Avoiding self medication
   b) Prescribing rationally
   c) Imposing strict punishments for drug related offences
   d) Teaching the public about hazards of medication
   e) Checking the sale of addictive drugs

6. The best way to reduce expenditure on drugs for primary health care is by:

   a) Checking the rise in cost of drugs
   b) Prescribing cheap and effective drugs
   c) Avoiding unwanted drug combinations
   d) Curtailing unnecessary prescriptions
   e) Encouraging research on cheaper new drugs

7. Physicians make errors in prescribing mainly because of

   a) Lack of knowledge about drugs
   b) Multiplicity of medicinal agents
   c) Unwanted drug combinations
   d) Biased information given by the drug manufacturer
   e) Difficulty in making the right choice

8. Prescription of vit.B_{12} and folic acid for fatigue or iron deficiency anaemia is:

   a) Incorrect prescription
   b) Inappropriate prescription
   c) Overprescription
   d) Multiple prescription
   e) Rational prescription

9. Methods of improving and promoting rational prescribing are:

a) Limitations on prescribing and dispensing
b) Creating public awareness of drug hazards
c) Preparation of essential drug list
d) Proper training and supervision of health care workers
e) All of the above

10. An example of inappropriate prescribing is writing a prescription of:

a) Rarely stocked drug in preference to readily available drug
b) Wrong drug due to erroneous diagnosis
c) Correct drug for too short a period
d) Wrong drug in the right dosage
e) Multiple drugs

11. An example of drug combination that is justified is

a) Levodopa with carbidopa
b) Diazepam with pyridoxine
c) Paracetamol with dextropropoxyphene
d) Streptomycin with chloroamphenicol
e) Magnesium trisilicate with diazepam

12. Trimethoprim and sulphamethoxazole combinations can be prescribed because

a) The cost is low
b) Quicker relief is obtained
c) Bactericidal effect is produced
d) Side effects are reduced
e) Bio-availability is increased

13. Commonest cause of non-compliance to drug regimen is

a) High cost of medication
b) Fear of side effects
c) Illiteracy
d) Polypharmacy
e) Lack of confidence in physician

Directions: For questions 14 to 25, circle the true or false against each of the following statement.

14.	List of essential drugs should be drawn up locally.	True / False
15.	Essential drug list should be updated periodically.	True / False
16.	Preparation of essential drug list should be the prerogative of pharmacologists.	True / False
17.	The selection of drugs for preparing an essential drug list should be based upon health needs.	True / False
18.	Drugs not figuring in the essential drug list should be banned.	True / False
19.	Total cost of treatment rather than the cost of individual drugs should be considered while selecting a drug.	True / False
20.	Between two similar drugs, one tried for longer period should be preferred for inclusion in the list.	True / False
21.	The model list of essential drugs of WHO is a universally applicable list.	True / False
22.	The quantum of drug use in a society is a direct indication of health consciousness of the people.	True / False
23.	Drugs not figuring in essential drugs list are redundant.	True / False

24.	The terms " proprietary" and "generic" are synonymous as far as drug nomenclature is concerned.	True / False
25.	The developing countries which constitute 66% of world's population get only 15% of the drugs.	True / False

WORKSHOP FOR INTERNS ON CONCEPT OF ESSENTIAL DRUGS AND RATIONALISED DRUG USE

PROGRAMME EVALUATION

	Yes	No	Don't Know
1. Were the objectives conveyed to you clearly?			
a) Of programme at the beginning of the course			
b) Of individual topics during the course			
2. Were the objectives relevant to the tasks you are expected to perform?			
3. Was educational material given to you, useful?			
4. Did the teaching/learning methods adopted during the sessions encourage your active participation?			
5. Do you think that this course will help you in rationalising your prescriptions?			
6. Do you think that current prescribing patterns need change?			
7. Time of the workshop in relation to Internship posting should be:			
a) In the beginning			
b) In the middle			
c) At the end			

	Yes	No	Don't Know

8. What should be the duration of the course?

   a) One day
   b) One and half day
   c) Two days
   d) Three days

9. Should the number of sessions be:

   a) Same
   b) Reduced
   c) Increased

10. Do you think that the topics included in the above workshop were adequate?

11. What is your overall impression of the programme?

    a) Very good
    b) Good
    c) Fair
    d) Poor

12. Who should bring about changes in prescribing pattern?

13. Any other suggestions: